EXHIBIT C

Sediment and Water Quality

Appendix H

Exhibit C
Sediment and Water Quality
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SEDIMENT AND WATER QUALITY

General

Sediment and water quality analyses of dredging and dredge material disposal sites are required to adequately address general criterion (b) and specific factors 4, 9, and 10 of 40 CFR 228.5 and 228.6 which require sediment and water quality analysis indicative of both the dredging areas and disposal sites. The purpose of these physical and chemical analyses is to help determine the contamination potential of dredged materials placed in Ocean Dredged Material Disposal Sites (ODMDSs). ODMDSs along the Oregon Coast usually receive medium to fine sands taken from entrance bar shoals and deposited on slightly finer continental shelf sands. Because of their coarse nature, similarity to ODMDS sediments, isolation from known existing or historical contaminant sources, and the presence of strong hydraulic regimes, material dredged from entrance bar shoals meet criteria for exemption from further testing according to provisions of 40 CFR 227.13(b). Sediment data collected from the mouth of the Columbia River (MCR), Columbia River navigation projects, and the zone of siting feasibility (ZSF) are presented (Figure 1: Appendix H, main report).

Origin of Dredged Material in the Lower Estuary

The Columbia River estuary is 4-5 miles wide and extends upstream to around RM 25. It contains 2 main channels, the North and the South channels. The South Channel is an extension of the main river channel upstream of the estuary and carries most of the upland river discharge. The navigation channel follows the South Channel through the estuary. The North Channel extends upstream to about RM 20, near Gray's Bay. Wide, shallow inter-tidal (between low water and high water marks) and sub-tidal (below low water mark) flats separate these 2 deep channels.

Mineralogy/Geology

The surface sediments off shore, from the inner continental shelf, to the estuary are primarily of the same origin, unconsolidated fine to medium sand deposited during the Holocene period. This material exists from the surface downward, averaging 20 – 40 feet thick. These sediments reflect the contribution of andesitic volcanic materials from the tributaries draining the slopes of the cascades. The petrology is predominantly volcanic rock fragments (basalt to dacite) and plagioclase feldspar supplied in large part from the volcanic arc. Metamorphic and plutonic rock fragments are also common, with minor components of quartz, potassium feldspar, and micas. Pyroxenes become the dominant heavy minerals in the lower Columbia reaches (Sherwood et al., 1984).

Sediment Transport

Sediment transport is determined by sediment grain size and water velocity. Sediments are transported in the river by two basic means; bedload transport (> 0.18 mm grain size), movement of the heavier particles along the bottom of the river and transport of the finer sediments in the water column called suspended transport (<0.15mm grain size). The river has low depositional rates of suspended load material; with most of this material either flushed out to sea or deposited in backwaters and eddies where velocities have dropped below critical values. It is estimated that 30 percent of the fine suspended sediment entering the estuary from up river is retained in the estuary. The coarser suspended sediments will be deposited where abrupt changes in channel section result in reduced velocities and transport capacity. It is likely that most of the estimated 2 mcy per year of total suspended sediment is transported to the ocean during high flows. Suspended sand transport in the river is estimated to be only 0.2 to 0.6 mcy per year and some of that is likely to be deposited in the estuary.

River water and sediments exit the river by three pathways: 1) a major pathway is westward across the outer delta, resulting in a tongue of estuarine sediment extending partially across the outer delta, 2) northward across Peacock Spit, adjacent to Benson Beach, and 3) southward, as bedload, through the natural channel during periods of extreme river discharge.

Upstream of CRM 10, tidal and salinity effects cause altering upstream and downstream bedload transport. The shapes of the sand waves indicate downstream transport to about CRM 18. Between CRMs 18 and 10, the sand waves transition from fluvial-dominated to tidal-dominated waves. Below CRM 10 to the entrance, bedload transport was found by Walter et al. (1979) to have net inland deposition most being near the entrance.

The predominantly upstream movement of ocean sediments through the entrance, as revealed by model tests, shows a net upstream bottom flow through the general area of the lower estuary. There is evidence that some of the sediment in the estuary has been transported from the adjacent nearshore and shelf regions. Studies of currents in the estuary have documented episodic landward flow predominance in the deeper portions of the entrance channels. Various physical and numeric models indicate net landward bottom flow and sediment transport through the entrance under low and moderate riverflow conditions. These interpretations imply that the Columbia River may be a sink rather than a source of littoral (ocean shore) sands in recent times (late Holocene period).

Schultz and Simmons (1957) state that the amount of fresh water discharged into an estuary coupled with the degree to which it mixes with the heavier salt water are major factors in establishing the hydraulic and shoaling regimens of an estuary. The difference in specific gravities of the fresh and sea waters creates density currents within an estuary, which cause bottom flood currents to predominate over bottom ebb currents by increasing the velocity and duration of the flood current and decreasing the velocity and duration of the ebb current.

Tidal forces have established a pattern of sediment transport within the Columbia Estuary, which is responsible for the fact that river sediments in transport close to the bottom are inhibited in their passage to the ocean. These forces also introduce ocean sediments into the estuary throughout the length of salinity intrusion. As a consequence, bottom sediments from the ocean as well as from the upland areas are gradually filling the estuary. Evidence of this is provided by a comparison of the hydrographic surveys of 1868 and 1958 within the 11-mile reach between north and south lines passing through upper Sand Island and Tongue Point (Lockett 1967).

A 1977 study was conducted by the Dept. of Oceanography, University of Washington under contract to the USACE, Portland District (Sternberg, 1977). As part of a geological investigation of the sedimentary environments of the mouth of the Columbia River, a total of 217-sediment grab samples were collected from various locations in the MCR project and offshore at the disposal sites. Current meters were located in the MCR to measure bottom current velocities. Current velocities were primarily tidal in composition, with maximum bottom current velocities occurring in the central section of the natural channel. This type of regime produces a distribution with finer sediments on the flanks and coarser sediments in the central parts of the channel. The study concluded that primarily tidal currents control sedimentation within the lower estuary, landward of the entrance jetties.

Bottom-drifting devices were deployed over a 2-yr period in the region of the river mouth in an effort to understand the net bottom currents (Morse et al. 1968). Drifters released less than 10km outside the river mouth had a dominant movement toward the river mouth being grounded along Clatsop Spit on the south side of the river. The primary movement of drifters not entering the river was from south to north. Typical speeds were on the order of 0.3 knots. Drifters released within the river estuary tended to migrate seaward presumably along the north side of the channel being grounded in a 2-nmi section at Benson beach just north of the river mouth. A small percentage of drifters also were recovered from Clatsop Spit. The recovery points at Clatsop Spit and at Benson Beach are areas of local sediment accumulation (Lockett 1962, Morse et al. 1968).

Characteristics of Sediment

The Corps examined textural characteristics of sediments from RM –2 to RM +16 as part of a 1959 measurement program. These analyses revealed the general negative skewness (departure from symmetrical distribution with tendency toward coarser diameters) of riverborne sediments as contrasted with zero or positive skewness (tendency toward finer diameters) of ocean sediments. The study showed (see Table C-1) a tendency of incoming ocean sediments, as identified by their positive skewness, to move within the north flood channel of the estuary.

Table C-1	Sediment Skewness					
	North Flood Channel			Navigation Channel		
Location of Sample	Median Grain Size (mm)	Phi Mean Diameter	Phi Skewness	Median Grain Size (mm)	Phi Mean Diameter	Phi Skewness
Offshore 2 Miles	0.19	2.39	0.00			
Mile 2	0.23	2.12	0.00	0.18	2.37	-0.27
Mile 5	0.17	2.77	0.31	0.20	2.21	-0.28
Mile 8	0.25	2.60	0.51	0.39	1.16	-0.18
Mile 16	0.49	1.09	0.08	0.42	1.13	-0.14

Most of the estuary reflects an even more restricted range of sediment size than is supplied by the river. The mean size of the estuary sediment is 0.117mm or fine sand. Sediment of this size is highly mobile in strong currents, found in the primary channels of the estuary (Sherwood and Creager, 1990).

Sediment and Water Quality of the MCR Project, Columbia River Channel, Miscellaneous Side Channels and ZSF

The authorized Mouth of the Columbia River (MCR) project provides for a 2640-foot wide channel from river mile (RM) -2 to RM 3 across the Columbia River Bar. The northerly 2,000 feet of the channel is authorized to 55 feet deep and the southerly 640 feet to 48 feet deep. Hopper dredges maintain the channel.

The project has two main shoaling areas. The outer shoal extends from approximately RM -1.6 to RM -1.0. The inner shoal, Clatsop Shoal, extends from approximately RM 0.0 to RM 2.6, beginning on the south side and crossing the channel near RM 1.0. To maintain the channel's southerly 48-foot depth in the winters between dredging operations, the depth is taken to 53 or 55 feet. To maintain the channel's northerly 55-foot depth between dredging operations, dredging is taken to 60 feet during the summer. Material dredged from the project is placed in ODMDSs.

The MCR project was selected as one of the Aquatic Disposal Field Investigations conducted as part of the Dredged Material Research Program (DMRP) (Boone, 1978). The DMRP was a nationwide program conducted by the Corps of Engineers to evaluate environmental impacts of dredging and dredged material disposal. EPA designated four ODMDSs (A, B, E and F) in 1986 for disposal of Mouth of the Columbia River (MCR) maintenance dredged material. The selection and eventual designation of these ODMDSs, documented in the 1983 ODMDS Designated Environmental Impact Statement (EIS), was based on studies of the physical, chemical and biological conditions offshore from the MCR (see **Sediment Quality** for further discussion of DMRP).

Mouth of the Columbia River (MCR) Material

August 1982 Two sediment samples were collected from the main navigational channel at RM 1.8 and RM 3.2 and were subjected to elutriate and bulk chemical as well as physical analysis. The highest Elutriate test release was 35% for manganese; 5% for cadmium; and less than 1% of the bulk concentration for all other metals. This work was preformed by the USGS under contract with the USACE, Portland District (Fuhrer, 1986).

July 1983 One sediment sample was collected from the main navigation channel at approximately RM 2.8 and subjected to bulk chemical and physical analysis. Cadmium was found to be associate with the 1% material finer than 100 microns (very fine sand) at a concentration of 2.2 ppm. As the concentration of organic carbon and iron (both of which would hinder biological uptake) was small: it was speculate that the cadmium may be in a form available to benthic organisms. However, bulk concentrations of cadmium in undifferentiated dredged material would be 0.022 ppm, well below established concern levels. This work was preformed by the USGS under contract with the USACE, Portland District (Fuhrer and Horowitz, 1989).

June 1990 Three sediment samples were collected from the Clatsop Spit shoal for physical analysis. Sample identification, location and grain analyses were recorded as follows: MCR-1 (RM 0) median grain size, 0.18 mm, MCR-2 (RM 0+40) median grain size of 0.22 mm, and MCR-3 (RM 2) median grain size, 0.33 mm. The shoal extended the full length of the 3-mile sampling area, however the largest volumes of dredge material were associated with the first two analyses. The third sample represented the east-end of the shoal where coarser grained material was deposited. The physical nature of the sediments has not changed from previous studies. They were comprised of 98.6% sand and 1.4% fines with a mean grain size of 0.26 mm. The volatile solids analysis was 0.6%, indicating low organic content. The material was considered suitable for unconfined in-water disposal without further testing.

Columbia River Channel

September/October 1984 Three 30-foot vibracores were collected from within the main Columbia River navigational channel, between RM -2.4 and 18.5 as part of the October 1987 Columbia River Coal Export Channel technical study. The cores were subdivided and subjected to bulk chemistry as well as physical analysis (Fuhrer and Horowitz, 1989).

September 1986 Sixteen 30-foot vibracores were collected from within and adjoining the main Columbia River navigational channel, between RM -2.4 and 18.5 and in lower Skipanon Channel, as part of the October 1987 Columbia River Coal Export Channel technical study. The cores were subdivided and subjected to bulk chemistry as well as physical analysis. Most areas consisted of fine, medium or coarse grained clean sands (USACE, 1987).

June 1997, Eighteen sediment samples were collected for physical analysis (Table C-2, Figure C-1) and two sediment samples for chemical analysis (Table C-3) from the Columbia River, river mile (RM) 6 through RM 28.3. These samples were part of a larger set of samples taken to evaluate sediment quality for the CRCD feasibility study. Average median grain size was 0.32mm, average percent silt/clay was 5.9%, and average volatile solids were 0.8% for all 18 samples. Sample stations 4,5 and 7 contained the highest percent silt/clay 17.5%, 7.5% and 74.5% respectively. The other fifteen samples averaged less than 0.5% silt/clay. Sample station 7 had the highest volatile solid percent of 4.0%. This fine grain material is from the turning basin adjacent to the Astoria ship terminal. The chemical analyses for sediment samples did not indicate any areas of concern as contaminant concentrations were below screening levels.

Side Channels

1984-1990 Tongue Point The1984 sampling event was the first detailed trace metals and organic compounds analysis of material from the Tongue Point area. Bottom material was obtained using a 20-foot vibra-core sampler. Organochlorine compounds detected and qualified, included Aldrin, DDD, DDE, gross polychlorinated biphenyls (PCBs) and gross polychlorinated naphalenes (PCNs), were found to be confined to the upper 3 feet of sediment. Polynuclear aromatic hydrocarbons (PAHs) were detected with concentrations ranging from 8 to 278 mg/kg. Metal concentrations were found to vary with depth and sediment size fractions. The highest concentrations of metals were found in the upper fine-grained sediment. The 1987 sampling was determined to be of little comparative value since most of the detection limits reported are too high to be of use. Battelle Pacific Northwest Laboratory collected sediment cores in 1988 under contract to USACE, Portland District for confirmatory chemical and solid phase bioassays for the Tongue Point Navigation Improvements Project. The purpose of this study was to determine the suitability of the Tongue Point sediments for ocean disposal.

Pre-dredging Baseline 1988-1989 Sediment samples were collected from five stations (Figure C-2) and mixed into two composite batches [stations 3+4+5; (C2) and stations 6+7; (C1) (Siipola, et. al., 1993). Sediment composites were analyzed for chemical (metals, PAHs pesticides/PCBs, and 5 conventional contaminates) and physical (grain size) properties.

One pesticide (DDD) and 10 PAHs were found either above detection limits or were considered present by the analyst. The pesticide DDD was below the calculated method detection limit but considered real. No PCB aroclors were detected. Measured PAHs totaled 1,059 mg/kg and 1,013 mg/kg (C2 and C1, respectively). Cadmium, lead and zinc were the metals of significance in the Tongue Point sediment.

Additional surface sediment samples were collected in September 1988 from four stations up river from Tongue Point (Figure C-3). The purpose of this sampling was to provide background data for the bald eagle mitigation/monitoring plan. Although these stations

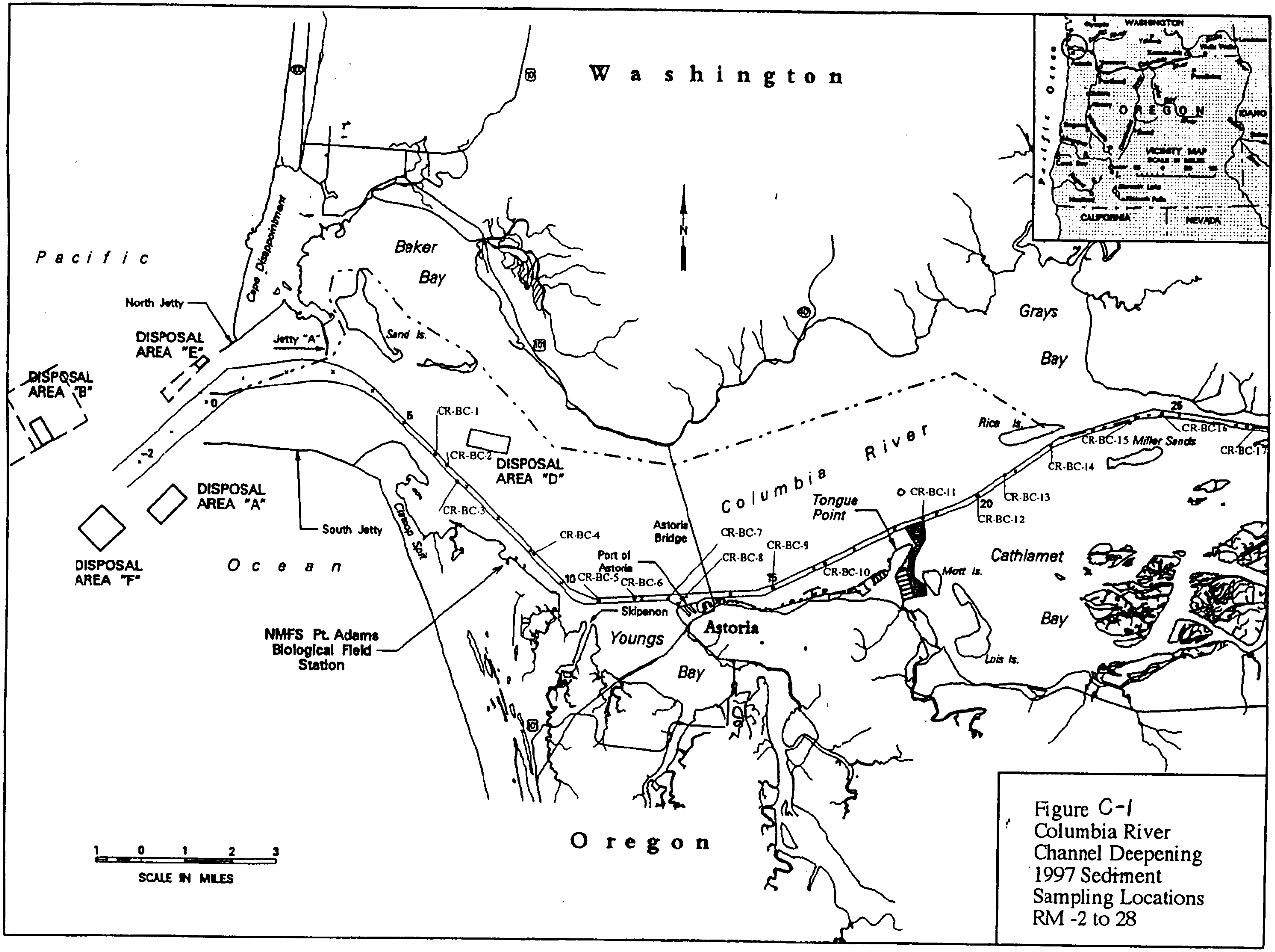


Figure C-1
Columbia River
Channel Deepening
1997 Sediment
Sampling Locations
RM -2 to 28

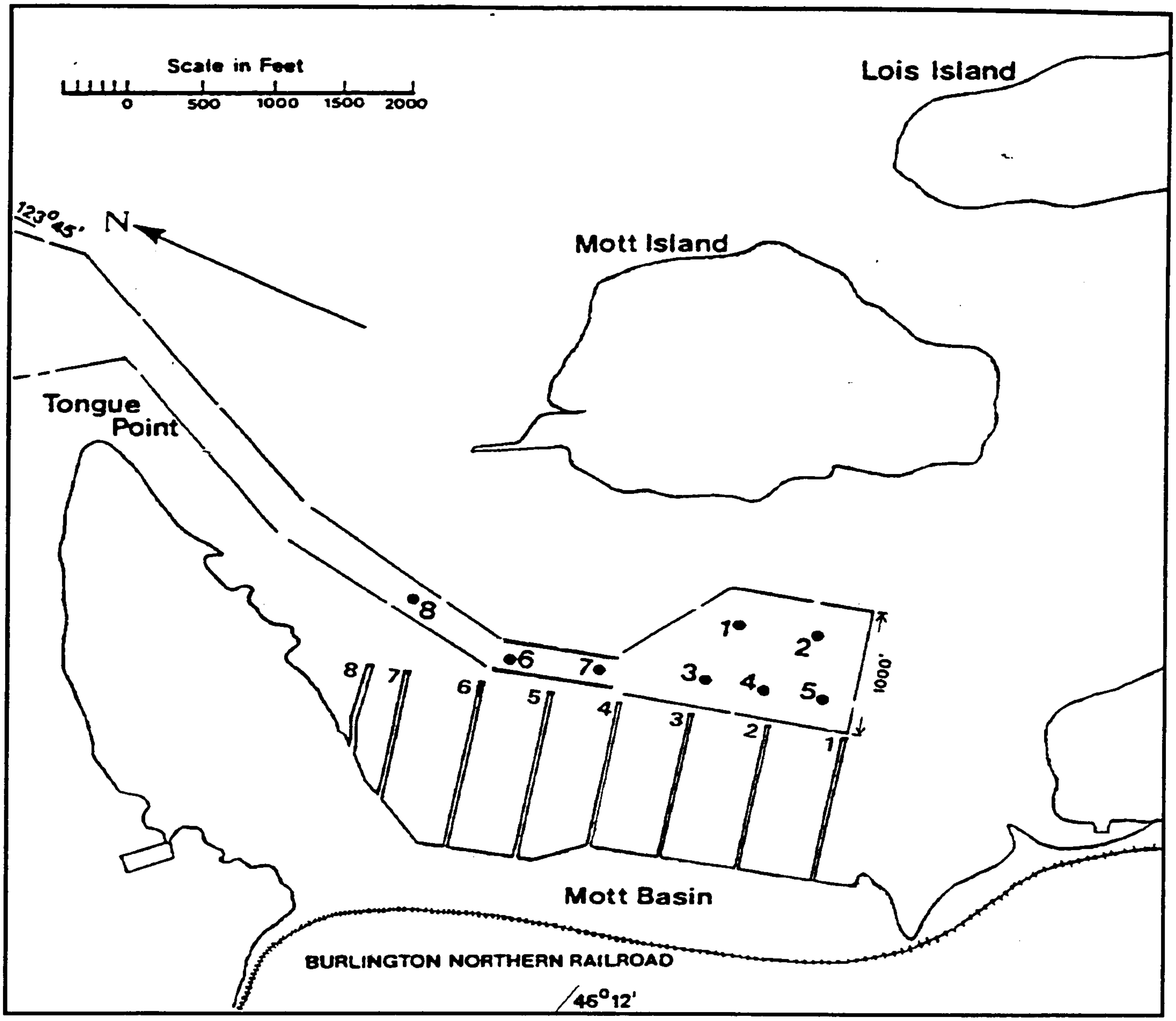
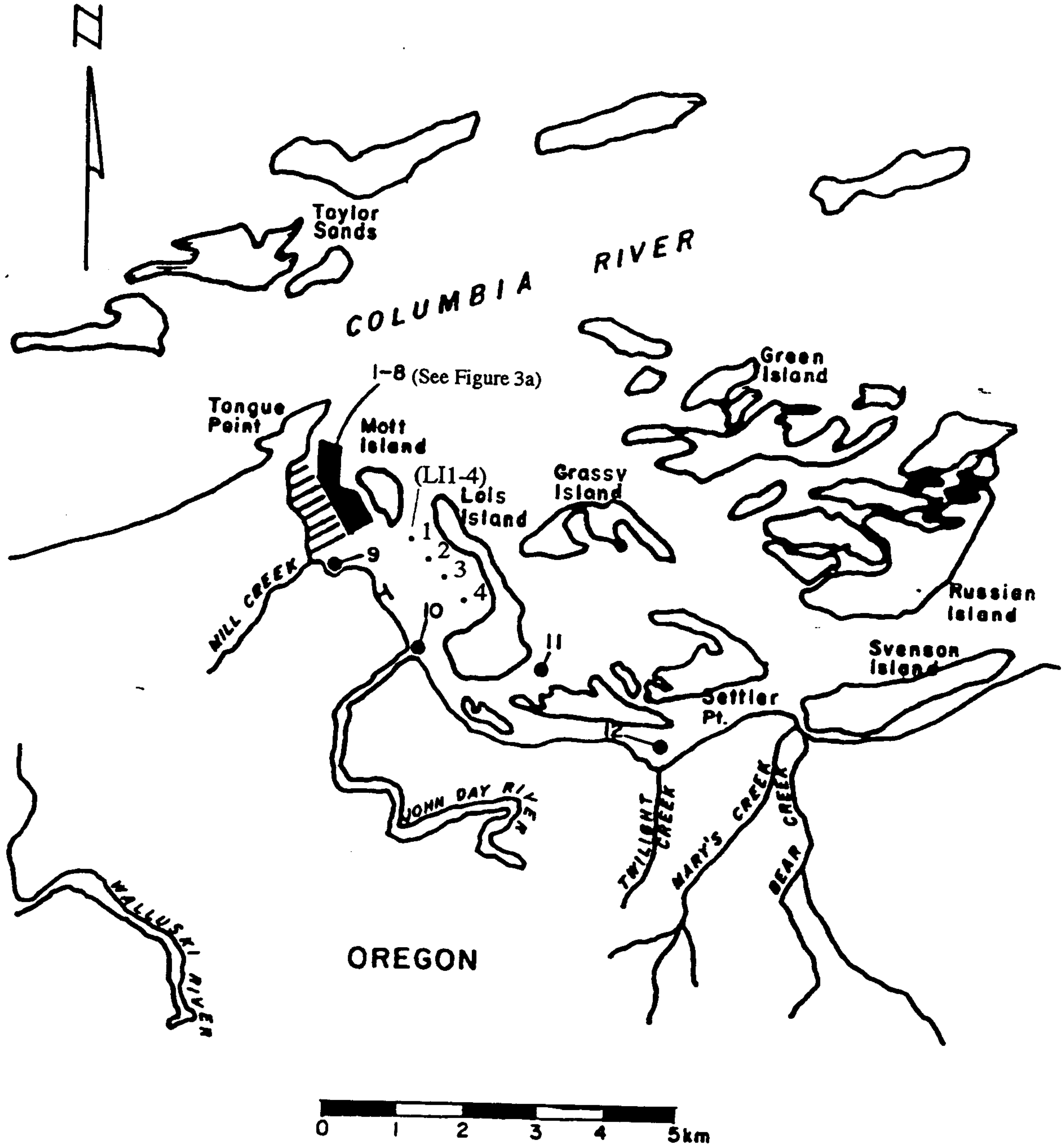


Figure C-2

Tongue Point Sediment Sampling Stations 1-8



SAMPLE NO.

1-8 Tongue Point Dredge Site

9 Mill Creek Emboyment

10 South Tongue Point

11 Lois Island East Marsh

12 Twilight Swamp

(LI 1-4) Lois Island Samples

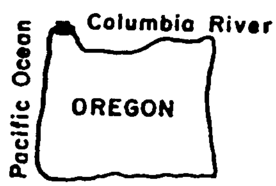


Figure C-3

Tongue Point Sediment Sampling Stations 9-12
and Lois Island Samples

were outside the Tongue Point dredging project, it was postulated that dredging could suspend and redistribute contaminated sediment into bald eagle foraging areas.

Four sediment samples were collected in July 1989 in a line near the western edge of Lois Island (Figure C-3). Theses were combined into two composites for chemical analysis. The analysis results are presented in Tables 4 & 5. Analysis for heavy metals showed no indication of significant contamination. No pesticides, PCBs or PAHs were detected in any of the September 1988 (PAHs not run) or Lois Island deep water sites.

Post-dredging Survey December 1989 & August 1990 On December 7 & 14, 1989 seven and fourteen days after dredging ceased sediment samples were collected from all stations corresponding to the pre-dredging sample locations. The results (Table C-4 & C-5) showed about 50% fines compared to pre-dredge samples of about 34% sand and 65% fines. There was an apparent increase in oil & grease from pre-dredge to post-dredge sediments (55.2ppm and 334.0ppm, respectively). All other analysis compared to pre-dredge results with all levels below the method detection limit.

Eight sediment samples were taken at dredge site stations in August 1990 and subjected to physical (grain size) and chemical (TOC, metals, pesticides/PCBs, and PAHs) analysis (Tables C-4 & C-5). All analysis were at or below method detection limits and comparable to previous testing results and below levels of concern.

Zone of Siting Feasibility (ZSF)

1974 - 1976 The Dredged Material Research Program (DMRP) conducted an intensive aquatic survey off the mouth of the Columbia River including sampling of dredging and disposal sites. They found that river sediments sampled in the dredging site prior to dredging showed only background levels of nutrients, metals, and other contaminate parameters. Extensive sampling was also conducted at the ODMDSs and offshore in general. As noted in section 3.0 of this report the MCR project was selected as one of the Aquatic Disposal Field Investigations conducted as part of DMRP. The MCR studies included work at an experimental ODMDS, Site G, located south of the MCR channel at an average depth of 85 feet. Following baseline physical, chemical, and biological characterizations of the site, a test dumping operation disposed of 600,000 cubic yards of medium to fine sands (medium grain diameter + 0.18mm) during July - August 1975. Sediments at the disposal site were a fine to very fine sand (median grain diameter = 0.11-0.15mm). Monitoring results indicated a mound of slightly coarser sediment within the site that gradually mixed with ambient sediments and dissipated over several months. Water quality monitoring during disposal showed no elevation of toxic heavy metals, including copper (Cu), zinc (Zn), cadmium (CD) and lead (Pb), with some nontoxic elevation of iron (Fe) and manganese (Mn). Nutrient fluctuations were associated primarily with tidal variations, as were chlorophyll and particulate organic carbon. Dissolved oxygen remained high throughout disposal at Site G. Oil & grease values in the sediments decreased slightly after disposal, while there were no elevations in ammonia. The authors concluded that there were no adverse impacts in terms of water/sediment quality of toxicity from disposal of MCR sands at Site G. They attributed fluctuations in tested variables primarily to sediment and suspended particulate input from the Columbia River, biological activity and processes and laboratory difficulties associated with repeated measurements close to analytical detection limits.

1977 A total of 217-sediment grab samples were collected from various locations in the MCR project and offshore at the disposal sites as part of a geological investigation of the sedimentary environments of the mouth of the Columbia River. The study was conducted by the Dept. of Oceanography, University of Washington under contract to the USACE, Portland District. The report concluded that the natural river channel acts as an entranceway for continental shelf water and sediments to enter the estuary.

November 1987 Ocean water samples collected as native disposal site water near the Columbia River mouth consistently have shown low contaminant levels. Water column nutrient levels at disposal Site A are influenced by both tides and river hydraulics during periods of high river discharge, whereas these levels at experimental disposal Site G, south of Area A, have more of an oceanic influence. Nutrients at disposal Site G are influenced more by tides than river hydraulics during low river discharge periods. High primary production and low nutrients occur during flooding tide stages, when oceanic water is carried over the site, while low primary productivity and high nutrient levels are characteristics of ebb stages when more river water is present.

Heavy metals levels also were mostly low in oceanic water samples taken for the DMRP study. Although data from disposal events were limited, these levels appeared to be unaffected by the disposal of MCR sands on Site G. Levels of metals, pesticides, herbicides, and nutrients in Pacific Ocean native water samples collected by USGS in adjacent areas west and south of MCR were low. Some ocean water samples have shown slightly elevated levels of iron, manganese, and nickel, but these are generally related to river discharges. Water quality parameters for samples taken near MCR are within normal ranges for coastal ocean waters in the Pacific Northwest region.

1989-1992 The Tongue Point Monitoring Program focused on determining bathymetric, sediment, contaminant and benthic invertebrate community changes in and adjacent to ODMDS F and sediment and contaminant changes in and around the Tongue point dredge site. This study was the result of dredging approximately two million cubic yards in 1989. Sediment samples were collected at 29 stations (Figure C-4) centered around ODMDS F for physical analysis (Table C-6). Mean sediment grain size in the pre-disposal ODMDS F samples was 0.16mm with a maximum of 0.18mm and a minimum of 0.12mm with a standard deviation of 0.012mm. The mean percent fines (% of material passing a 230 mesh sieve [0.0625mm]) was 0.91% by weight with a maximum of 2.10%, a minimum of 0.40% and a standard deviation of 0.47%. Chemical analyses (Table C-7) were conducted on selected sediment samples from the ODMDS F study area. Pre-disposal analyses were conducted on 7 samples collected in July 1989. Post-disposal chemical analyses were conducted on 13 samples collected in March 1990 and 8 samples collected in June 1992. No pesticides or PCBs were detected in any of the ODMDS F samples. With the one exception of Pyrene (20.0ppb) in sample F2 (June 1992), no PAHs were detected.

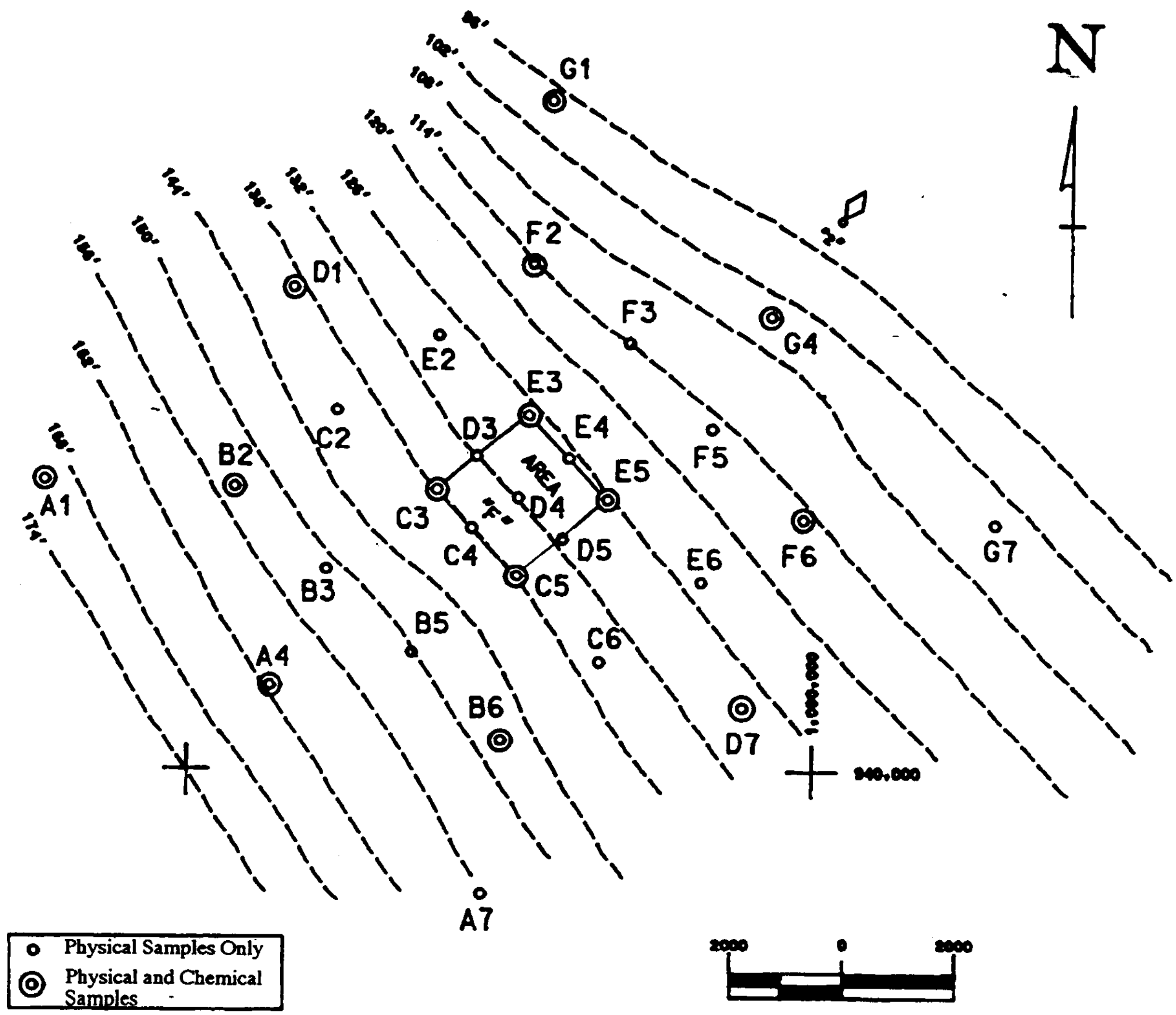


Figure C-4

ODMD Site F Sampling Station, 1989-1992

Heavy metal concentrations in all samples were below established levels of concern, though metal concentrations increased as percent fines increased.

July 1992 EPA, Region 10 funded a wide spread reconnaissance study of the benthic invertebrate community and sediment physical and chemical characteristics offshore from the MCR. Fifty-two sediment samples were collected at 51 stations; 2 of the samples were classified as "sandy silt," 37 as "silty sand," 8 as "poorly graded sand with silt," and 5 as "poorly graded sand" (Table C-8, Figure C-5). Less than 1.5% of the material in any of the samples was coarser than 0.2 mm (#60 sieve), a medium sand. Maximum clay content was 8.9% and 28 stations had 0.0% clay. Sediment grain size south of the mouth of the Columbia River was fairly uniform, ranging in medium grain size from 0.12mm to 0.18mm. Median grain size decreased in a southerly direction. Maximum median grain size was associated with the northern ebb tidal delta and ODMDS B. Northwest of ODMDS B, a distinct decreasing gradient in grain size was found. This gradient was the most pronounced feature of all physical sediment measurements. Median grain size in this area ranged from 0.06mm to 0.09mm. This area of fine-grained material forms a plume to the northwest and is bordered on the east, south, and west by coarser material (Figure C-6). The plume appears to be independent of depth contours except its association with the seaward edge of the ebb tidal delta. Percent fines (material less than 0.0625mm) ranged from 0.30% to 48.60%. Generally percent fines increased directly with depth, both in sediments collected north and south of the mouth of the Columbia River. Stations north of the mouth of the Columbia River had higher percent fines than the southern stations at similar depths. Overall, the fines content formed a plume, or lobe of material with high silt content, that extended to the northwest from the seaward edge of the ebb tidal delta. Percent volatile solids ranged from 0.3% (Station 47) to 6.6% (Station 18). Percent volatile solids generally increased with depth and in a northerly direction.

Due to variations in sediment characteristics noted during sampling, two sediment samples were collected at Station 39 for physical and chemical analyses. The first grab sample collected was a very fine-grained material, but was not submitted for analysis. The second grab produced a clean sandy material (median grain size 0.21mm, percent fines 4.5%, and volatile solids 0.6%) as expected at this location and depth. The third grab at the same station produced fine-grained material, similar to the first grab. This sample was retained for benthic analysis. A fourth grab produced fine-grained material, similar to grabs 1 and 3. This sample (Sample 39A) was retained for both physical and chemical sediment analyses. Sample 39A had a median grain size of 0.08mm, fines of 37.5%, and volatile solids of 2.4%. Chemical analyses (Table C-9) were conducted on all samples except at station 8 and 9, (Figure C-5) at the mouth of the Columbia River. No PCBs were detected. All pesticides, PAHS and heavy metals detected were at low levels.

July 1993 Samples were collected off the MCR. These samples are concentrated around ODMDS B and ODMDS F. Overall average median grain size was 0.16mm, percent silt/clay was 10.6%, and volatile solids were 1.7% (Table C-10). There was less variation in median grain size than in percent silt/clay, which range from 1.1% to 77.2%. The highest silt/clay value was measured at Station 54, which is almost directly off the mouth of the Columbia River. Stations with highest percent silt/clay were generally deeper in the north side of the Columbia

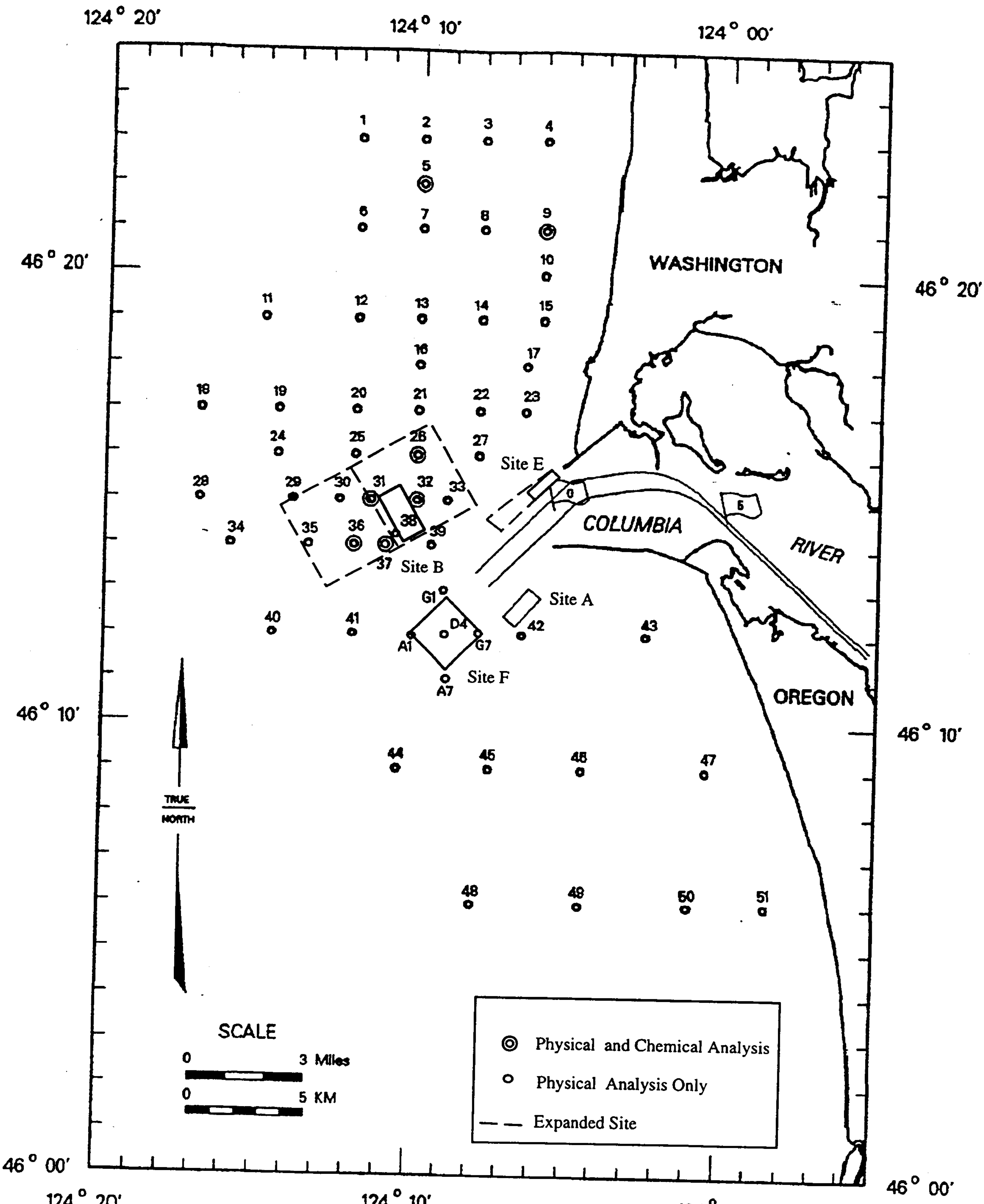


Figure C-5
Mouth of the Columbia River Sediment Sampling Stations, 1992.

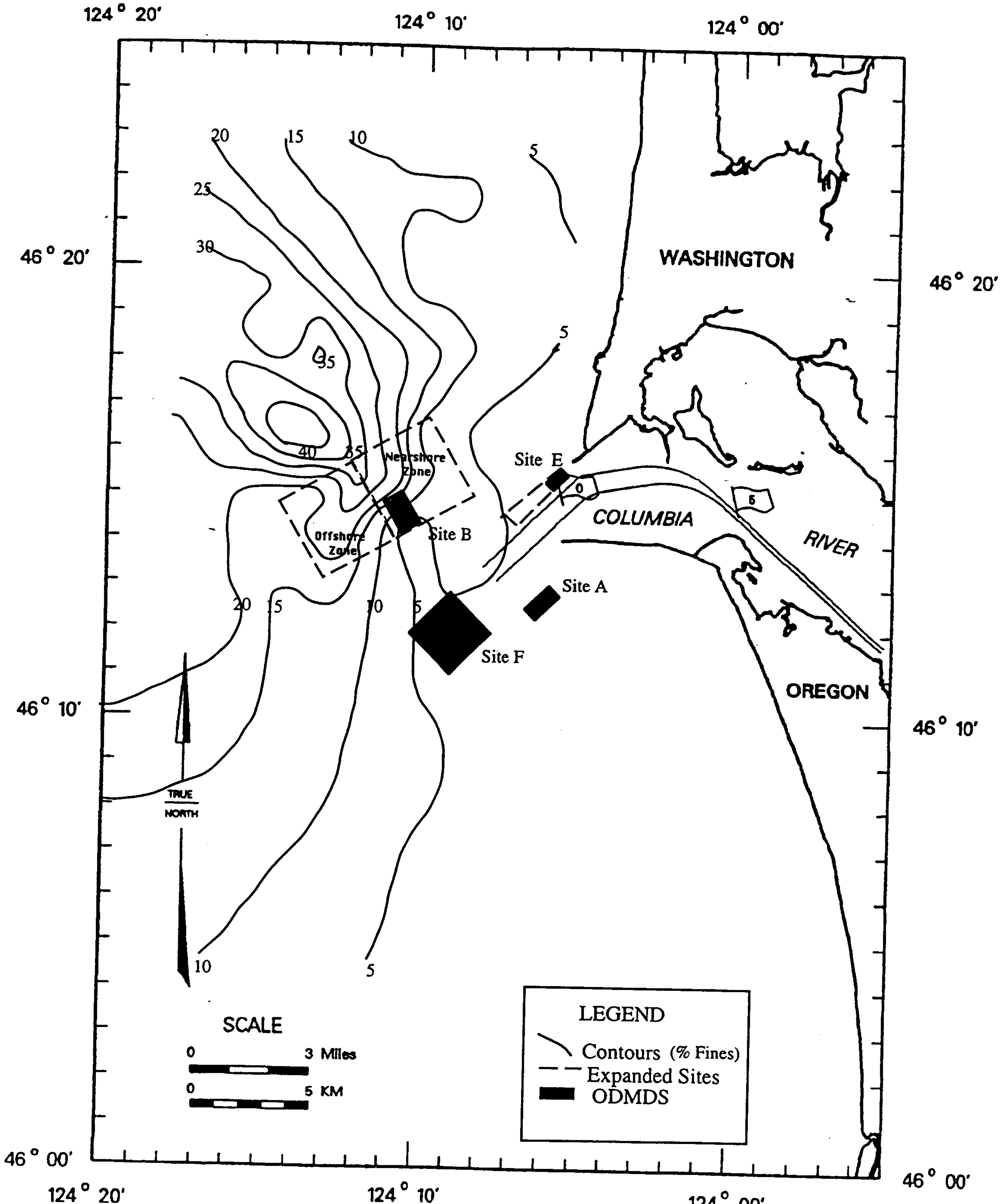


Figure C-6
Columbia River Entrance Channel and ODMDSs
Percent Fines On Seabed '92/'96 Average

River mouth (Figure C-7). Percent volatile solids were generally low, ranging from 0.6% to 3.4% at all stations except Station 54, where it was 9.0%.

There is a significant but poor relationship between percent silt/clay and median grain size (regression, $r2 = 0.62$, $P < 0.01$). However, there was a good direct relationship between percent volatile solids and percent silt/clay (regression, $r2 = 0.91$, $P < 0.01$).

August 1994 The samples collected in August 1994 off the MCR were from the same stations sampled in July 1993, around ODMDS B and ODMDS F. Average median grain size was 0.15mm, average percent silt/clay was 13.2%, and average percent volatile solids were 1.1% for all 30 stations (Table C-11). Sediments from 22 of 30 stations were classified as fine sand (median grain size 0.125-0.250mm). The highest silt/clay value was measured at Station 30, which is about 60 m deep and located just north from the mouth of the Columbia River. Stations with highest percent silt/clay were generally in water deeper than 40m and were located slightly north from the Columbia River mouth (Figure C-7). Percent volatile solids were generally low, ranging from 0.1% to 5.2%, with most values < 1.0%. Generally stations that had the highest percent silt/clay values also had the highest percentage volatile solids values.

October 1995 Thirty-six samples were collected off the MCR (Table C-12, Figure C-8). These samples were located to the west and north of ODMDS B and ODMDS F. Overall average median grain size was 0.12mm with a range of 0.054mm to 0.16mm. The solids ranged from 0.6% to 4.6% with an average of 1.8%. Two samples were graded "poorly graded sand with silt", one sample was graded "sandy silt" and the balance was graded "silty sand". This data confirms that of the 1992 study that a plume of finer grained material (<. 10mm) exists to the northwest of ODMDS B.

June 1996 Thirty-nine samples were collected off the MCR (Table C-13, Figure C-8). These samples were collected from the same stations as the October 1995 samples with the addition of three locations (37,37B, 37C). Overall average median grain size was 0.12mm with a range of 0.043mm - 0.16mm. The average percent silt/clay was 21.4 % (range 4.3% to 54.5%) with the average percent volatile solids at 1.8 % (range 0.4% to 4.2%). There was less variation in median grain size (0.043mm - 0.16mm) than in percent silt/clay (4.3% to 54.5%). All samples were graded "silty sand" with the exception of two "sandy silt" and two "poorly graded sand with silt". This data confirms that of the 1992 and 1995 studies that a plume of finer grained material (<. 10mm) exists to the northwest of ODMDS B (Figure C-6). There was little overall change in the physical analysis from the 1995 sampling.

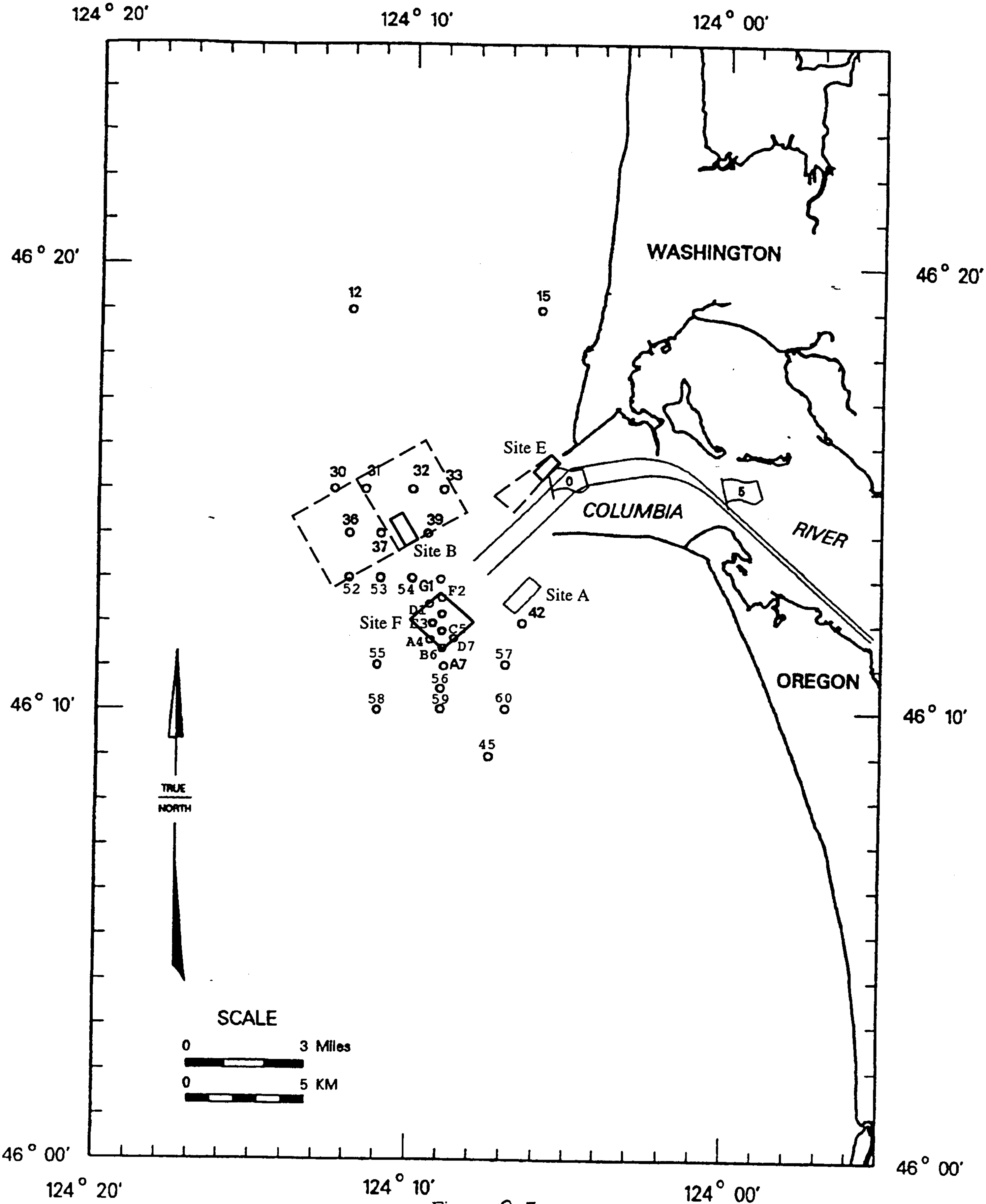


Figure C-7

The Mouth of the Columbia River Sediment Sampling Stations 1993 & 1994

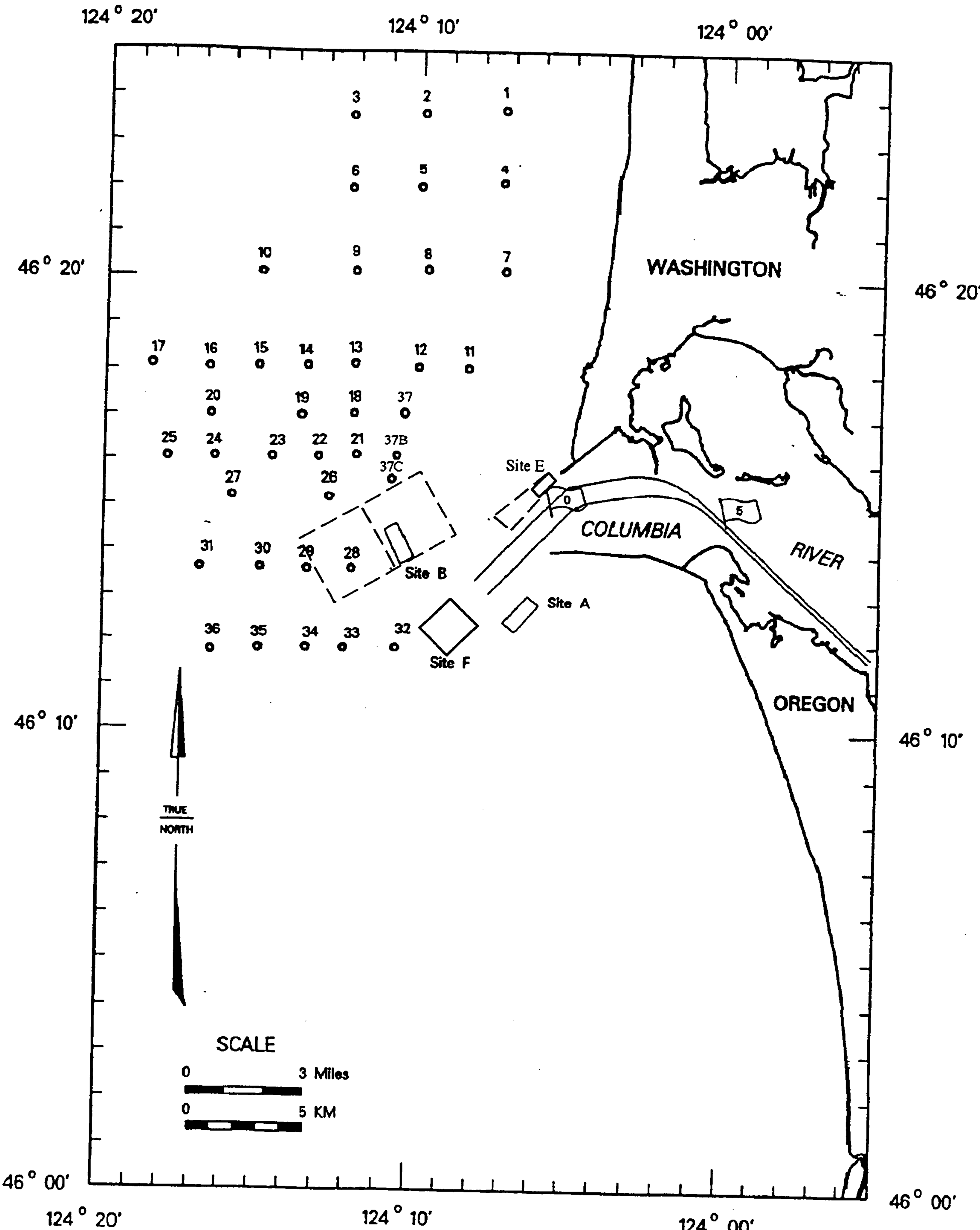


Figure C-8
ODMDS - MCR Study, 1995 & 1996 Sites

Disposal Sites (ODMDS) Covered by Marine Littoral Sediment Deposits

Studies done at several ODMDS sites indicate that "native" littoral sediments quickly cover disposal sediments. This is confirmed for both fine-grained dredged material as well as coarse-grained material.

In 1989 approximately 2 million cys (median grain sized 0.067mm) of dredge material from Tongue Point was placed at Site F. Subsequent monitoring over the next 4 years at Site F showed the median grain size of surface grab samples collected was 0.15mm in 1989 prior to placement, 0.14mm in 1990, 0.13mm in 1991 and 0.16 in 1992 (Table C-6). These sampling events indicate that the fine-grained materials, (0.067mm) placed in 1989, were covered naturally by "native" material, as indicated by the 1989 through 1992 sampling events. Bathymetric surveys showed that the material placed in 1989 was not eroded away.

In 1990 three samples were collected from a large shoal on the south side of the main navigational channel of the MCR. Sample identification, location and grain analyses were recorded as follows: MCR-1 (RM 0) median grain size, 0.18 mm, MCR-2 (RM 0+40) median grain size of 0.22 mm, and MCR-3 (RM 2) median grain size, 0.33 mm. The shoal extended the full length of the 3-mile sampling area, however the largest volumes of dredge material were associated with the first two analyses. The third sample represented the east-end of the shoal where coarser grained material was deposited. Subsequent sampling of the ODMD sites off the MCR in 1992 showed a median grain size of 0.12 mm, indicating that the coarse-grained material was covered with "native" sediment.

The 1975 experimental disposal of 600,000 cy at Site G created an identifiable sediment mound, consisting of primarily estuarine type sediments (0.25-0.18 mm). The characteristic sediments placed at Site G by the disposal experiment have tended to be dispersed very slowly, with a net displacement in a north-northwest direction. The annual mass transport is estimated at only 0.2 percent of the total deposit at Site G and migration is only about 0.25 nmi per year. Continental shelf sediment repopulated the area surrounding the disposal mound in what can be described as a pre-disposal configuration. The only area where disposal sediment could still be detected was a patch on the top of the mound, where wave energy is concentrated on the mound because of slight wave refraction. Post disposal studies demonstrate that energy conditions are such that recovery of the area to its original mineralogical state was nearly complete 4 months after termination of the experimental disposal operation (Sternberg et al, 1977).

Table C-2, Columbia River Channel Deepening Surface Sediment, 1997 Physical Analysis.
(For sample location map see Figure C-1, Page C-7).

Location	Site	Date	Median (mm)	Sand (%)	Vfsand (%)	Silt (%)	Clay (%)	Volsol (%)
Columbia - CRCD	CR-BC-01	6/2/97	0.420	11.30	3.80	2.50		1.00
Columbia - CRCD	CR-BC-02	6/2/97	0.260	47.80	1.30	0.70		0.60
Columbia - CRCD	CR-BC-03	6/2/97	0.300	32.20	0.50	0.00		0.60
Columbia - CRCD	CR-BC-04	6/2/97	0.170	90.10	21.70	14.30	3.20	1.50
Columbia - CRCD	CR-BC-05	6/2/97	0.180	83.40	10.20	5.90	1.60	0.90
Columbia - CRCD	CR-BC-06	6/2/97	0.360	16.90	0.50	0.10	0.00	
Columbia - CRCD	CR-BC-07	6/2/97	0.046	91.30	70.10	59.10	15.40	4.00
Columbia - CRCD	CR-BC-08	6/2/97	0.360	10.90	0.20	0.00		0.50
Columbia - CRCD	CR-CB-09	6/2/97	0.320	26.50	0.90	0.50		0.70
Columbia - CRCD	CR-CB-10	6/2/97	0.320	26.90	1.20	0.50		
Columbia - CRCD	CR-BC-11/12	6/2/97	0.320	31.90	0.20	0.40		0.60
Columbia - CRCD	CR-BC-11/12	6/2/97	0.270	41.90	1.30	0.10		0.60
Columbia - CRCD	CR-BC-13	6/2/97	0.460	3.30	0.40	0.20		0.60
Columbia - CRCD	CR-BC-14	6/2/97	0.380	9.10	0.70	0.50		
Columbia - CRCD	CR-BC-15	6/2/97	0.340	37.00	1.90	0.40		0.70
Columbia - CRCD	CR-BC-16	6/2/97	0.350	12.50	0.20	0.10		0.70
Columbia - CRCD	CR-BC-17	6/2/97	0.620	4.70	0.50	0.40		0.60
Columbia - CRCD	CR-BC-18	6/2/97	0.210	70.70	2.10	0.30		

Table C-3, Columbia River Channel Deepening, Surface Sediment, 1997 Chemical Analysis. (For sample location map see Figure C-1, Page C-7).

TOC (%) and AVS mg/kg (ppm)

Site	Date	TOC	AVS
CR-BC-05	6/2/97	0.16	0.70
CR-BC-07	6/2/97	1.29	61.00

Metals mg/kg (ppm)

Site	Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Zinc
CR-BC-05	6/2/97	3.00	<1.000	11.00	7.00	4.00	<0.200	13.00	<2.000	40.00
CR-BC-07	6/2/97	3.00	<1.000	14.00	17.00	7.00	<0.200	17.00	<2.000	66.00

Pesticides and PCBs ug/kg (ppb)

Site	Date	Aldrin	DDD	DDE	DDT	Aroclor 1254	Aroclor 1260
CR-BC-05	6/2/97	<2.00	<2.00	<2.00	<2.00	<10.00	<10.00
CR-BC-07	6/2/97	<2.00	**0.50**	**0.90**	**3.00**	<10.00	<10.00

Low PAHs ug/kg (ppb)

Site	Date	Acenaphthene	Acenaphthylene	Anthracene	Dibenzofuran	Fluorene
CR-BC-05	6/2/97	<5.0	<5.0	<5.0	<5.0	<5.0
CR-BC-07	6/2/97	3.0	0.8	2.0	2.0	2.0

Site	Date	Methylnaphthalene	Naphthalene	Phenanthrene	Total Low PAHs
CR-BC-05	6/2/97	5.0	2.0	1.0	8
CR-BC-07	6/2/97	4.0	5.0	8.0	27

High PAHs ug/kg (ppb)

Site	Date	Benzoanthracene	Benzofluroanthene	Benzoperylene	Benzopyrene	Chrysene
CR-BC-05	6/2/97	<5.0	1.0	<5.0	0.7	0.8
CR-BC-07	6/2/97	7.0	7.0	9.0	9.0	9.0

Site	Date	Dibenzoanthracene	Fluoranthene	Indopyrene	Pyrene	Total High PAHs
CR-BC-05	6/2/97	0.9	2.0	0.7	1.0	7
CR-BC-07	6/2/97	1.0	12.0	8.0	14.0	76

Table C-4, Tongue Point Sediment Samples, 1984-1990 Physical Analysis, Ammonia and TOC. (For sample locaton map see Figure C-2, C-3, Page C-8, C-9).

Station	Date	Grain Size Mean mm	Grain Size Median mm	Grain Size Distribution Sand % finer	Vf Sand % finer	Silt % finer	Clay %	Nh4 ppm	TOC mg/g	Volatile Solids % by wgt
CB-6a	07/31/84			100.00	52.00	13.00	2.00		2.20	
CB-6a	07/31/84			98.00	56.00	35.00	8.00			
CB-6b	07/31/84			98.00	32.00	13.00	2.00		10.60	
C-1/2	06/02/87			100.00	59.10	46.00	13.10	22.00	8.26	1.87
C-3/4/5	06/02/87			100.00	81.13	58.33	12.80	20.80	11.10	3.30
C-6/7	06/02/87			100.00	100.00	64.50	15.30	17.80	11.05	1.58
C-3/4/5	08/22/88			100.00	80.14	58.00	12.87	105.00	0.93	
C-6/7	08/22/88			100.00	70.78	50.23	10.56	131.00	0.80	
TP-9	08/22/88	0.050	0.158	91.40	32.00	6.20	3.00		1.00	1.10
TP-10	08/22/88	0.148	0.149	95.30	37.60	6.90	1.00		1.40	1.40
TP-11	08/22/88	0.157	0.044	99.70	97.70	71.70	1.00		4.60	1.10
TP-12	08/22/88	0.045	0.029	99.80	99.50	96.10	4.00		5.80	4.00
LI-1/2	07/24/89	0.049	0.017	99.80	99.35	91.90	12.85		1.23	8.20
LI-3/4	07/24/89	0.049	0.045	99.80	92.90	65.90	9.05		0.89	4.15
LI-1/2	07/24/89	0.029	0.024	99.75	99.50	88.90	7.90		0.96	3.70
LI-3/4	07/24/89	0.000	0.011	99.40	99.00	97.45	19.45		2.41	9.25
TP-1/2	07/24/89	0.081	0.058	99.45	90.55	54.55	7.65		0.63	2.60
TP-3	07/24/89	0.108	0.100	98.40	60.00	27.30	5.10		1.05	2.60
TP-4	07/24/89	0.073	0.087	97.60	81.70	47.20	6.90		0.55	2.60
TP-5	07/24/89	0.040	0.029	99.60	95.20	75.60	12.20		1.53	3.90
TP-6/7	07/24/89	0.080	0.070	97.15	75.60	48.80	6.85		0.52	2.70
TP-8	07/24/89	0.032	0.024	99.60	98.30	83.00	14.50		1.95	6.10
TP-9	07/24/89	0.122	0.110	96.80	60.30	10.70	0.00		0.76	1.10
TP-10	07/24/89	0.173	0.170	93.80	15.40	2.00	0.00		0.17	0.90
TP-11	07/24/89	0.047	0.041	99.70	99.60	74.30	3.80		0.58	2.10
TP-12	07/24/89	0.045	0.038	99.40	96.90	72.70	4.80		0.77	2.40
TP-S-1/2	08/13/90	0.048	0.044	99.70	98.20	63.30	8.30			3.70
TP-S-2	08/13/90	0.073	0.072	99.50	84.10	41.50	7.60			1.90
TP-S-3	08/13/90	0.147	0.140	88.30	42.80	15.20	2.60			1.50
TP-S-4	08/13/90	0.051	0.036	97.70	89.90	67.80	9.30			5.30
TP-S-5	08/13/90	0.074	0.065	98.50	87.90	46.60	1.90			2.70
TP-S-6	08/13/90	0.084	0.059	98.10	90.30	53.30	3.10			5.60
TP-S-8	08/13/90	0.058	0.064	99.50	89.00	48.90	1.90			2.60

Table C-5, Tongue Point Sediment Samples, 1984-1990 Metals Analysis (ppm). (For sample locaton map see Figure C-2, C-3, Page C-8, C-9).

Station	Date	Iron	Manganese	Arsnic	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Cadmium
CB-6a	07/31/84	6000.00	180.00		4.00	10.00	12.00	<0.100	5.00	55.00	0.60
CB-6a	07/31/84	9000.00	310.00		3.00	16.00	5.00	<0.100	6.00	23.00	0.20
C-1/2	06/02/87			<1.00	12.30	16.20	8.53	0.090		61.10	0.480
C-3/4/5	06/02/87			<1.00	15.90	22.20	16.70	0.180		111.00	0.870
C-6/7	06/02/87			<1.00	15.00	20.85	15.05	0.090		109.50	0.770
C-3/4/5	08/22/88			5.18	22.80	35.10	20.53	0.160	22.40	161.80	1.210
C-6/7	08/22/88			5.43	25.00	30.80	18.23	0.140	23.00	134.00	1.160
TP-9	08/22/88	12700.00	319.00	4.27	12.80	8.86	9.61	0.020	6.64	52.70	0.120
TP-10	08/22/88	14000.00	373.00	5.88	13.60	8.86	9.47	0.020	6.11	54.20	0.130
TP-11	08/22/88	17300.00	430.00	6.45	16.40	19.40	24.40	0.040	8.87	87.50	0.210
TP-12	08/22/88	20000.00	307.00	6.10	18.90	21.20	13.20	0.050	9.92	91.90	0.290
LI-1/2	07/24/89			16.00	26.00	39.00	13.10	0.110		133.00	0.620
LI-3/4	07/24/89			8.00	20.00	23.00	9.90	0.060		93.00	0.620
LI-1/2	07/24/89			10.50	23.00	29.00	12.00	<0.080		104.00	0.670
LI-3/4	07/24/89			12.80	34.00	52.00	26.00	0.120		157.00	1.200
TP-1/2	07/24/89			4.50	16.00	14.00	6.50	<0.030		63.00	0.250
TP-3	07/24/89			5.30	16.00	16.00	5.90	<0.040		57.00	0.240
TP-4	07/24/89			7.20	18.00	18.00	7.80	<0.040		70.00	0.400
TP-5	07/24/89			10.60	26.00	37.00	14.00	0.100		122.00	1.040
TP-6/7	07/24/89			6.00	16.00	18.00	7.50	<0.060		67.00	0.520
TP-8	07/24/89			12.80	27.00	37.00	14.00	<0.110		128.00	0.850
TP-9	07/24/89			6.30	14.00	15.00	6.30	<0.030		64.00	0.360
TP-10	07/24/89			5.80	13.00	7.60	5.30	<0.020		52.00	0.240
TP-11	07/24/89			8.80	18.00	18.00	11.00	<0.050		87.00	0.440
TP-12-R1	07/24/89			11.60	19.00	17.00	12.00	<0.050		83.00	0.460
TP-12-R2	07/24/89			9.30	19.00	17.00	9.50	<0.050		81.00	0.480
TP-S-1/2	08/13/90			2.00	13.00	2.40	6.00	0.024	9.50	52.00	0.260
TP-S-3	08/13/90			2.90	18.00	8.00	3.70	0.017	13.00	46.00	0.120
TP-S-4	08/13/90			2.70	14.00	9.20	3.10	0.064	10.00	72.00	0.440
TP-S-5	08/13/90			2.20	15.00	6.50	4.10	0.022	12.00	42.00	0.280
TP-S-6	08/13/90			3.20	33.00	17.00	3.70	0.038	27.00	47.00	0.310
TP-S-8	08/13/90			3.20	13.00	11.00	3.70	0.065	9.50	64.00	0.000

Note: The symbol "< " denotes a non-detect at the numerical level listed.

Table C-5 (cont'd), Tongue Point Sediment Samples, 1984-1990 Pesticides/PCB Analysis (ppb). (For sample location map see Figure C-2, C-3, Page C-8, C-9).

Station	Date	Aldrin	DDD	DDE	DDT	Lindane	Metoxychlor	PCBs
CB-6a	7/31/84	<0.01	**1.30**	**0.40**	<0.01	<0.01	<0.01	**2.00**
CB-6a	7/31/84	**0.10**	<0.01	<0.01	<0.01	<0.01	<0.01	<1.0
CB-6b	7/31/84	<0.01	**8.90**	**0.90**	**0.20**	<0.01	<0.01	**15.00**
C-1/2	6/2/87	<15.00	<10.00	<15.00	<10.00	<15.00		<500.00
C-3/4/5	6/2/87	<15.00	<10.00	<15.00	<10.00	<15.00		<500.00
C-6/7	6/2/87	<15.00	<10.00	<15.00	<10.00	<15.00		<500.00
C-3/4/5	9/12/88	<2.00	**2.40**	<4.00	<4.00	<2.00	<8.00	<40.00
C-6/7	9/12/88	<2.00	**1.90**	<4.00	<4.00	<2.00	<8.00	<40.00
TP-9	9/12/88	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<40.00
TP-10	9/12/88	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<40.00
TP-11	9/12/88	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<40.00
TP-12	9/12/88	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<40.00
LI-1/2	12/17/89	<2.00	<4.00	<4.00	<4.00	<2.00	<8.00	<40.00
LI-3/4	12/17/89	<2.00	<4.00	<4.00	<4.00	<2.00	<8.00	<40.00
LI-1/2	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
LI-3/4	12/17/89	<6.00	<12.00	<12.00	<12.00	<6.00	<24.00	<120.00
TP-1/2	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-3	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-4	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-5	12/17/89	<3.00	**3.00**	<6.00	<6.00	<3.00	<12.00	<60.00
TP-6/7	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-8	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-9-Rl	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-9-R2	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-10	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-11	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-12	12/17/89	<3.00	<6.00	<6.00	<6.00	<3.00	<12.00	<60.00
TP-S-l/2	8/13/90	<2.70	<2.70	<2.70	<2.70	<2.70	<5.50	<27.00
TP-S-3	8/13/90	<2.90	<2.90	<2.90	<2.90	<2.90	<7.80	<29.00
TP-S-4	8/13/90	<3.40	<3.40	<3.40	<3.40	**3.40**	**4.70**	<34.00
TP-S-5	8/13/90	<2.80	<2.80	<2.80	<2.80	<2.80	<5.70	<28.00
TP-S-6	8/13/90	<2.90	<2.90	<2.90	<2.90	<2.90	<5.80	<29.00
TP-S-8	8/13/90	<3.30	<3.30	<3.30	<3.30	<3.30	<6.50	<33.00

Note: The symbol "< " denotes a ncn-detect at the nunerical level listed.

Table C-5 (cont'd), Tongue Point Sediment Samples, 1984-1990 Low Polynuclear Aromatic Hydrocarbon (ppb). (For sample location map see Figure C-2, C-3, Page C-8, C-9).

Station	Date	Acenaphthene	Acenapthylene	Anthracene	Fluorene	Napthalene	Phenanthrene	Total Low PAHs
CB-6b	07/31/84	<7.0	<6.0	<20.0	<6.0	**8.0**	**72.0**	**80.0**
C-1/2	06/02/87	<200.0	<200.0	<1000.0	<200.0	<200.0	<200.0	<1000.0
C-3/4/5	06/02/87	<200.0	<200.0	<1000.0	<200.0	<200.0	<200.0	<1000.0
C-6/7	06/02/87	<200.0	<200.0	<1000.0	<200.0	<200.0	<200.0	<1000.0
C-3/4/5	08/22/88	<60.0	<60.0	<60.0	<60.0	<60.0	**48.0**	**48.0**
C-6/7	08/22/88	<57.0	<57.0	<57.0	<57.0	<57.0	**55.0**	**55.0**
LI-1/2	07/24/89	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0
LI-3/4	07/24/89	<30.0	<30.0	<30.0	<30.0	<30.0	**15.0**	**15.0**
LI-1/2	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
LI-3/4	07/24/89	<150.0	<150.0	<150.0	<150.0	<150.0	<150.0	<150.0
TP-1/2	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-3	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-4	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-5	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-6/7	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-8	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-9	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-10	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-11	07/24/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-12	12/17/89	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0	<75.0
TP-S-1/2	08/13/90	<1.1	<0.4	**0.7**	<0.9	<2.9	**3.5**	**4.2**
TP-S-3	08/13/90	<1.1	<0.4	<0.5	<0.9	<3.0	<1.2	<3.0
TP-S-4	08/13/90	**1.9**	**1.7**	**3.4**	**3.9**	<3.5	**21.6**	**32.5**
TP-S-5	08/13/90	<1.1	<0.5	**0.7**	<0.9	<3.0	**4.4**	**5.1**
TP-S-6	08/13/90	**1.8**	**1.5**	**1.6**	**2.8**	**5.7**	**10.8**	**24.2**
TP-S-8	08/13/90	**9.8**	**2.8**	**5.5**	**10.4**	**8.8**	**35.2**	**72.5**
TP-S-8R	08/13/90	**4.2**	**1.6**	**4.5**	**5.7**	**5.9**	**27.4**	**49.3**

Note: The symbol "< " denotes a non-detect at the numerical level listed.

Table C-5 (cont'd), Tongue Point Sediment Samples, 1984 - 1990 High Polynuclear Aromatic Hydrocarbon (ppb). (For sample location map see Figure C-2, C-3, Page C-8, C-9).

Station	Date	Benzoanthracene	Benzofluranthene	Benzoperylene	Benzopyrene	Chrysene	Dibenzoanthracene	Indenopyrene	Fluoranthene	Pyrene	Total High PAHs
CB-6b	7/31/84	**159.0**	**261.0**	**173.0**	**223.0**	**76.0**	<200.0	<132.0	**278.0**	**260.0**	**1430.0**
C-1/2	6/2/87	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<200.0	<200.0	<1000.0
C-3/4/5	6/2/87	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<200.0	<200.0	<1000.0
C-6/7	6/2/87	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<1000.0	<200.0	<200.0	<1000.0
C-3/4/5	8/22/88	**62.0**	**140.0**	**140.0**	**95.0**	**97.0**	<60.0	**110.0**	**93.0**	**150.0**	**887.0**
C-6/7	8/22/88	**68.0**	**160.0**	**180.0**	**66.0**	**110.0**	<57.0	**160.0**	**110.0**	**150.0**	**1004.0**
LI-1/2	12/17/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	<30.0	<130.0
LI-3/4	12/17/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	**42.0**	**42.0**
LI-1/2	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
LI-3/4	12/17/89	<220.0	<200.0	<600.0	<400.0	<150.0	<600.0	<600.0	<150.0	<150.0	<600.0
TP-1/2	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-3	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-4	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-5	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-6/7	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-8	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-9	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-10	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-11	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-12	12/17/89	<75.0	<100.0	<300.0	<200.0	<75.0	<300.0	<300.0	<75.0	<75.0	<300.0
TP-S-1/2	8/13/90	**6.0**	**9.9**	**5.3**	**3.6**	**8.6**	**0.7**	**3.3**	**5.2**	**4.8**	**47.4**
TP-S-3	8/13/90	**1.7**	**2.3**	**1.7**	**0.9**	**2.1**	<0.4	**1.1**	**1.9**	**2.3**	**14.0**
TP-S-4	8/13/90	**28.9**	**67.9**	**40.6**	**32.1**	**49.2**	**4.4**	**22.6**	**47.8**	**52.6**	**346.1**
TP-S-5	8/13/90	**6.5**	**14.3**	**14.1**	**8.5**	**9.2**	**1.3**	**6.8**	**12.8**	**17.2**	**90.7**
TP-S-6	8/13/90	**26.3**	**44.1**	**20.4**	**21.5**	**28.6**	**2.8**	**11.0**	**27.2**	**28.5**	**211.4**
TP-S-8	8/13/90	**37.2**	**83.1**	**54.3**	**41.1**	**59.0**	**5.4**	**31.6**	**68.0**	**69.8**	**449.5**
TP-S-8R	8/13/90	**20.9**	**42.7**	**35.4**	**22.5**	**27.4**	**3.1**	**19.6**	**43.2**	**47.6**	**263.4**

Note: The symbol "< " denotes a non-detect at the numerical level listed.

Table C-6, ODMD Site F Sediment Samples, 1989-1992 Physical Analysis. (For sample location map see Figure C-4, Page C-12).

Station	Date	Median	Grain Size Distribution				Date	Median	Grain Size Distribution				Date	Median	Grain Size Distribution			
		mm	Sand % finer	Vf Sand % finer	Silt % finer	Clay %		mm	Sand fine	f Sand % finer	Silt % fine	Clay %		mm	Sand fine	f Sand % finer	Silt fine	Clay %
SF-A1	07/10/89	0.170	97.40	16.30	1.60	0.00	03/01/90	0.160	97.40	23.40	1.70	0.00	06/27/90	0.160	97.90	17.50	0.90	0.00
SF-A4	07/10/89	0.170	96.40	16.60	2.10	0.00	03/01/90	0.160	98.00	18.30	0.60	0.00	06/27/90	0.160	97.40	26.80	2.50	0.00
SF-A7	07/10/89	0.160	98.30	22.50	0.40	0.00	03/01/90	0.160	96.70	20.80	0.60	0.00	06/27/90	0.160	97.80	24.60	0.40	0.00
SF-B2	07/10/89	0.160	98.10	25.00	1.20	0.00	03/01/90	0.110	97.50	54.30	26.00	0.00	06/27/90	0.160	91.60	24.70	1.30	0.00
SF-B3	07/10/89	0.150	98.40	27.10	0.80	0.00	03/01/90	0.170	95.90	15.80	0.30	0.00	06/27/90	0.160	97.70	25.20	0.60	0.00
SF-B5	07/10/89	0.140	97.90	40.30	0.70	0.00	03/01/90	0.160	97.80	26.40	3.10	0.00	06/27/90	0.150	97.20	33.00	0.60	0.00
SF-B6	07/10/89	0.140	98.10	36.10	0.50	0.00	03/01/90	0.160	98.60	23.70	0.60	0.00	06/27/90	0.150	97.80	34.70	0.40	0.00
SF-C2	07/10/89	0.100	96.20	66.10	1.50	0.00	03/01/90	0.081	96.20	72.60	38.60	6.60	06/27/90	0.130	91.60	50.00	27.50	3.10
SF-C3	07/10/89	0.150	96.90	34.10	1.10	0.00	03/01/90	0.049	99.90	82.70	55.00	8.60	06/27/90	0.083	96.20	66.60	38.00	2.90
SF-C4	07/10/89	0.160	97.50	26.30	0.50	0.00	03/01/90	0.110	94.60	54.80	31.70	0.00	06/27/90	0.150	95.60	30.10	1.10	0.00
SF-C5	07/10/89	0.150	98.10	34.20	0.60	0.00	03/01/90	0.099	91.90	59.40	33.80	0.00	06/27/90	0.100	96.10	58.70	32.90	3.90
SF-C6	07/10/89	0.140	98.40	37.10	0.50	0.00	03/01/90	0.150	96.10	32.70	0.40	0.00	06/27/90	0.140	97.90	35.90	0.60	0.00
SF-D1	07/10/89	0.180	86.30	15.30	0.90	0.00	03/01/90	0.140	93.30	38.40	2.80	0.00	06/27/90	0.170	86.60	21.60	1.30	0.00
SF-D3	07/10/89	0.150	97.70	31.10	1.00	0.00	03/01/90	0.025	97.50	86.90	68.70	12.90	06/27/90	0.170	89.80	21.10	1.10	0.00
SF-D4	07/10/89	0.160	97.00	26.50	0.80	0.00	03/01/90	0.091	98.40	63.60	35.50	0.00	06/27/90	0.150	93.50	34.50	3.00	0.00
SF-D5	07/10/89	0.160	96.80	24.60	0.70	0.50	03/01/90	0.150	97.10	33.60	0.70	0.00	06/27/90	0.140	96.80	37.60	0.70	0.00
SF-D7	07/10/89	0.140	98.50	37.10	0.60	0.00	03/01/90	0.140	97.90	36.60	0.50	0.00	06/27/90	0.140	97.40	37.60	0.40	0.00
SF-E2	07/10/89	0.170	90.00	17.90	1.90	0.00	03/01/90	0.083	94.90	67.40	41.20	7.60	06/27/90	0.088	96.90	70.60	30.00	1.40
SF-E3	07/10/89	0.150	96.60	34.40	0.70	0.00	03/01/90	0.087	98.20	73.60	50.10	10.20	06/27/90	0.067	97.70	76.30	46.80	2.70
SF-E4	07/10/89	0.150	95.90	28.60	0.70	0.00	03/01/90	0.130	95.20	46.40	16.50	0.00	06/27/90	0.120	97.10	54.50	16.10	1.20
SF-E5	07/10/89	0.150	95.60	34.40	0.90	0.00	03/01/90	0.140	96.50	39.30	0.80	0.00	06/27/90	0.140	94.80	38.00	0.70	0.00
SF-E6	07/10/89	0.150	97.30	32.80	0.60	0.00	03/01/90	0.140	97.50	35.90	0.60	0.00	06/27/90	0.150	96.30	32.70	0.70	0.00
SF-F2	07/10/89	0.170	87.00	18.40	1.90	0.00	03/01/90	0.140	92.30	40.50	9.00	0.00	06/27/90	0.170	87.20	22.10	3.00	0.00
SF-F3	07/10/89	0.170	88.10	17.40	0.60	0.00	03/01/90	0.091	94.30	65.20	30.50	0.00	06/27/90	0.170	84.10	21.40	1.20	0.00
SF-F5	07/10/89	0.150	93.10	33.40	0.70	0.00	03/01/90	0.160	92.40	20.80	0.50	0.00	06/27/90	0.150	91.70	32.80	0.80	0.00
SF-F6	07/10/89	0.150	96.50	33.40	0.60	0.00	03/01/90	0.150	92.80	30.60	0.80	0.00	06/27/90	0.160	93.20	27.80	0.60	0.00
SF-G1							03/01/90	0.190	79.40	11.50	1.10	0.00	06/27/90	0.210	65.00	7.30	1.20	0.00
SF-G4	07/10/89	0.160	88.90	26.90	0.70	0.00	03/01/90	0.170	89.00	15.10	0.40	0.00	06/27/90	0.170	83.70	18.80	1.90	0.00
SF-G7	07/10/89	0.150	96.40	33.60	0.70	0.00	03/01/90	0.160	94.60	25.50	0.30	0.00	06/27/90	0.140	95.60	37.90	0.30	0.00

Table C-6 (cont'd), ODMD Site F Sediment Samples, 1989-1992 Physical Analysis (For sample location map see Figure C-4, Page C-12).

Station	Date		Grain Size Distribution					Date		Grain Size Distribution			
		Median mm	Sand % finer	Vf Sand % finer	Silt % finer	Clay %			Median mm	Sand % finer	Vf Sand % finer	Silt % finer	Clay %
SF-A1	07/11/91	0.170	95.60	16.40	2.20	0.00		07/01/92	0.160	98.20	23.50	8.10	2.50
SF-A4	07/11/91	0.140	97.50	38.80	0.70	0.00		07/01/92	0.160	97.90	17.50	1.30	0.00
SF-A7	07/11/91	0.160	98.10	19.50	0.30	0.00		07/01/92	0.150	96.70	30.70	0.10	0.00
SF-B2	07/11/91	0.140	92.50	37.60	2.00	0.00		07/01/92	0.160	95.20	18.70	1.60	0.00
SF-B3	07/11/91	0.130	96.70	44.10	0.90	0.00		07/01/92	0.140	97.50	41.00	0.90	0.00
SF-B5	07/11/91	0.150	95.60	31.70	0.50	0.00		07/01/92	0.160	97.60	20.40	1.00	0.00
SF-B6	07/11/91	0.160	96.80	21.70	1.20	0.00		07/01/92	0.160	97.80	23.10	0.90	0.00
SF-C2	07/11/91	0.170	87.20	21.40	1.30	0.00		07/01/92	0.240	54.40	7.20	1.30	0.00
SF-C3	07/11/91	0.130	91.40	47.60	12.30	0.00		07/01/92	0.170	89.00	17.80	1.20	0.00
SF-C4	07/11/91	0.140	96.20	37.90	11.50	4.40		07/01/92	0.150	96.40	28.30	3.10	0.00
SF-C5	07/11/91	0.150	97.60	27.10	0.70	0.00		07/01/92	0.160	96.80	26.40	1.10	0.00
SF-C6	07/11/91	0.130	97.50	50.20	0.60	0.00		07/01/92	0.150	97.50	30.40	0.60	0.00
SF-D1	07/11/91	0.170	84.00	22.20	3.90	0.00		07/01/92	0.150	93.30	34.70	14.80	4.00
SF-D3	07/11/91	0.070	93.80	82.50	39.30	7.30		07/01/92	0.160	88.70	24.80	0.90	0.00
SF-D4	07/11/91	0.130	95.70	465.10	18.30	4.70		07/01/92	0.150	97.10	29.70	2.70	0.00
SF-D5	07/11/91	0.140	95.90	55.30	0.80	0.00		07/01/92	0.140	96.70	39.30	0.90	0.00
SF-D7	07/11/91	0.120	97.50	52.10	0.20	0.00		07/01/92	0.150	97.80	30.30	0.80	0.00
SF-E2	07/11/91	0.100	93.60	73.60	19.50	5.70		07/01/92	0.140	92.50	43.30	21.60	0.00
SF-E3	07/11/91	0.090	96.30	68.40	37.80	7.10		07/01/92	0.160	96.20	25.40	1.50	0.00
SF-E4	07/11/91	0.150	96.20	31.00	1.70	0.00		07/01/92	0.150	96.00	29.30	0.60	0.00
SF-E5	07/11/91	0.150	96.10	28.30	0.50	0.00		07/01/92	0.160	95.60	25.00	0.60	0.00
SF-E6	07/11/91	0.150	97.00	32.10	0.90	0.00		07/01/92	0.100	97.10	64.70	0.20	0.00
SF-F2	07/11/91	0.160	87.10	24.90	4.70	0.00		07/01/92	0.076	95.00	59.90	48.30	9.00
SF-F3	07/11/91	0.150	83.50	35.30	0.60	0.00		07/01/92	0.160	93.60	21.80	1.30	0.00
SF-F5	07/11/91	0.160	93.30	21.50	1.10	0.00		07/01/92	0.170	92.00	19.50	0.60	0.00
SF-F6	07/11/91	0.140	94.40	42.00	0.90	0.00		07/01/92	0.150	95.30	28.00	0.40	0.00
SF-G1	07/11/91	0.013	91.00	46.20	19.60	3.60		07/01/92	0.200	66.80	12.80	0.80	0.00
SF-G4	07/11/91	0.015	86.50	35.90	2.50	0.00		07/01/92	0.160	91.10	29.00	0.90	0.00
SF-G7	07/11/91	0.130	91.10	48.30	0.90	0.00		07/01/92	0.160	94.10	25.30	0.20	0.00

Table C-7, ODMD Site F Sediment Samples, 1989-1992 Total Organic Carbon (TOC). (For sample location map see Figure C-4, Page C-12).

Station	Date	TOC mg/g	Date	TOC mg/g	Date	TOC mg/g	Date	TOC mg/g	Date	TOC mg/g
SF-A1	07/09/85		02/28/86		06/26/86		07/10/87	1.30	06/30/88	0.57
SF-A4	07/09/85		02/28/86	0.07	06/26/86	0.16	07/10/87	0.95	06/30/88	0.17
SF-A7	07/09/85		02/28/86		06/26/86		07/10/87	1.20	06/30/88	1.20
SF-B2	07/09/85	0.06	02/28/86	0.29	06/26/86	0.06	07/10/87	1.00	06/30/88	0.17
SF-B3	07/09/85		02/28/86		06/26/86		07/10/87	0.94	06/30/88	0.11
SF-B5	07/09/85		02/28/86		06/26/86		07/10/87	1.10	06/30/88	0.13
SF-B6	07/09/85	0.08	02/28/86	0.07	06/26/86	0.04	07/10/87	1.30	06/30/88	0.10
SF-C2	07/09/85		02/28/86		06/26/86		07/10/87	0.72	06/30/88	0.08
SF-C3	07/09/85		02/28/86	1.03	06/26/86	0.51	07/10/87	1.40	06/30/88	0.08
SF-C4	07/09/85		02/28/86		06/26/86		07/10/87	1.70	06/30/88	0.01
SF-C5	07/09/85	0.07	02/28/86	0.38	06/26/86	0.26	07/10/87	0.94	06/30/88	0.08
SF-C6	07/09/85		02/28/86		06/26/86		07/10/87	0.76	06/30/88	0.09
SF-D1	07/09/85		02/28/86	0.04	06/26/86	0.03	07/10/87	1.70	06/30/88	1.08
SF-D3	07/09/85		02/28/86		06/26/86		07/10/87	3.00	06/30/88	0.06
SF-D4	07/09/85	0.12	02/28/86	0.71	06/26/86	0.10	07/10/87	2.30	06/30/88	0.15
SF-D5	07/09/85		02/28/86		06/26/86		07/10/87	1.00	06/30/88	0.08
SF-D7	07/09/85		02/28/86	0.05	06/26/86	0.03	07/10/87	0.96	06/30/88	0.07
SF-E2	07/09/85		02/28/86		06/26/86		07/10/87	1.50	06/30/88	1.10
SF-E3	07/09/85	0.07	02/28/86	0.63	06/26/86	0.52	07/10/87	4.60	06/30/88	0.11
SF-E4	07/09/85		02/28/86		06/26/86		07/10/87	0.93	06/30/88	0.07
SF-E5	07/09/85		02/28/86	0.04	06/26/86	0.02	07/10/87	0.75	06/30/88	0.08
SF-E6	07/09/85		02/28/86		06/26/86		07/10/87	1.50	06/30/88	0.06
SF-F2	07/09/85	0.07	02/28/86	0.08	06/26/86	0.05	07/10/87	1.80	06/30/88	1.97
SF-F3	07/09/85		02/28/86		06/26/86		07/10/87	0.57	06/30/88	0.07
SF-F5	07/09/85		02/28/86		06/26/86		07/10/87	0.75	06/30/88	0.10
SF-F6	07/09/85	0.21	02/28/86	0.04	06/26/86	0.03	07/10/87	0.67	06/30/88	0.07
SF-G1			02/28/86		06/26/86		07/10/87	7.30	06/30/88	<0.05
SF-G4	07/09/85		02/28/86	0.04	06/26/86	0.03	07/10/87	0.54	06/30/88	0.06
SF-G7	07/09/85		02/28/86		06/26/86		07/10/87	0.71	06/30/88	0.08

Table C-7 (cont'd), ODMD Site F Sediment Samples, 1989-1992 Metal Analysis (ppm). (For sample location map see Figure C-4, Page C-12).

Station	Date	Arsnic	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Cadmium
SF-B2	07/10/89	5.40	27.00	6.30	5.00	0.04	0.0	52	<0.050
SF-B6	07/10/89	5.40	25.00	6.30	3.70	<0.03	0.0	45	<0.030
SF-C5	07/10/89	2.60	30.00	6.60	5.80	<0.02	0.0	56	<0.040
SF-D4	07/10/89	4.80	30.00	6.70	5.60	<0.02	0.0	56	0.070
SF-E3	07/10/89	2.00	27.00	6.80	3.30	<0.02	0.0	54	<0.050
SF-F2	07/10/89	4.50	20.00	5.70	4.80	<0.03	0.0	43	<0.040
SF-F6	07/10/89	3.20	28.00	6.40	5.60	<0.02	0.0	53	<0.040
SF-A4	03/01/90	2.70	19.50	4.75	4.59	0.02	14.5	38	0.040
SF-B2	03/01/90	4.20	18.50	10.70	4.83	0.03	14.0	50	0.020
SF-B6	03/01/90	4.30	19.70	4.60	4.87	0.02	14.0	37	0.020
SF-C3	03/01/90	8.15	23.65	26.85	10.85	0.11	19.5	91	0.630
SF-C5	03/01/90	5.90	16.00	12.20	5.94	0.03	14.0	50	0.215
SF-D1	03/01/90	3.70	11.90	4.20	3.33	<0.02	10.0	29	<0.020
SF-D4	03/01/90	4.20	26.80	16.20	7.20	0.06	18.0	75	0.400
SF-D7	03/01/90	2.70	27.40	5.90	5.17	<0.02	17.0	49	0.030
SF-E3	03/01/90	8.10	26.40	19.80	7.20	0.07	19.0	76	0.550
SF-E5	03/01/90	3.79	24.70	6.00	4.84	0.02	15.0	48	0.030
SF-F-2	03/01/90	3.30	19.00	6.80	3.79	0.02	14.0	43	0.060
SF-F6	03/01/90	2.80	27.10	6.80	4.96	<0.02	15.0	51	0.040
SF-G4	03/01/90	3.10	15.00	4.20	3.69	0.02	12.0	30	0.020
SF-B2	06/29/92	3.00	18.00	7.00	4.00	<0.02	14.0	42	<0.100
SF-B6	06/29/92	3.00	22.00	6.00	5.00	<0.02	15.0	43	<0.100
SF-C5	06/29/92	3.00	26.00	6.00	5.00	<0.02	14.0	48	<0.100
SF-D1	06/29/92	4.00	13.00	9.00	5.00	<0.02	11.0	44	0.200
SF-D4	06/29/92	3.00	21.00	8.00	5.00	<0.02	15.0	48	<0.100
SF-E3	06/29/92	3.00	20.00	6.00	5.00	<0.02	14.0	43	<0.100
SF-F2	06/29/92	6.00	20.00	22.00	11.00	0.08	16.0	76	0.500
SF-F6	06/29/92	3.00	21.00	6.00	5.00	<0.02	13.0	45	<0.100

Note: The symbol "< " denotes a non-detect at the numerical level listed.

Table C-7 (cont'd), ODMD Site F, 1989-1992 Pesticide and PCB Analysis (ppb). (For sample location map see Figure C-4, Page C-12).

Station	Date	Aldrin	Chlordane	Dieldrin	DDD	DDE	DDT	Endosulfan	Endrin	Heptachlor	Lindane	Metoxychlor	Toxaphene	PCBs
SF-B2	07/10/89	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<1.0	<1.0	<4.0	<150.0	<20.0
SF-B6	07/10/89	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<1.0	<1.0	<4.0	<150.0	<20.0
SF-C5	07/10/89	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<1.0	<1.0	<4.0	<150.0	<20.0
SF-D4	07/10/89	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<1.0	<1.0	<4.0	<150.0	<20.0
SF-E3	07/10/89	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<1.0	<1.0	<4.0	<150.0	<20.0
SF-F2	07/10/89	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<1.0	<1.0	<4.0	<150.0	<20.0
SF-F6	07/10/89	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<1.0	<1.0	<4.0	<150.0	<20.0
SF-A4	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-B2	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-B6	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-C3	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-C5	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-D1	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-D4	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-D7	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-E3	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-E5	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-F-2	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-F6	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-G4	03/01/90	<3.0	<4.0	<6.0	<6.0	<6.0	<6.0	<3.0	<6.0	<3.0	<3.0	<12.0	<450.0	<60.0
SF-B2	06/29/92	<2.0	<10.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<30.0	<10.0
SF-B6	06/29/92	<2.0	<10.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<30.0	<10.0
SF-C5	06/29/92	<2.0	<10.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<30.0	<10.0
SF-D1	06/29/92	<3.0	<10.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<6.0	<50.0	<20.0
SF-D4	06/29/92	<2.0	<10.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<30.0	<10.0
SF-E3	06/29/92	<2.0	<10.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<30.0	<10.0
SF-F2	06/29/92	<5.0	<30.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<80.0	<30.0
SF-F6	06/29/92	<2.0	<10.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<30.0	<10.0

Note: The symbol "< "denotes a non-detect at the numerical level listed.

Table C-7 (cont'd), ODMD Site F Sediment Samples, 1989-1990 Low Polynuclear Aromatic Hydrocarbon (PAH) (ppb). (For sample location map see Figure C-4, Page C-12).

Station	Date	Acenaphthene	Acenapthylene	Anthracene	Fluorene	Napthalen	Phenanthrene	Total Low PAHs
SF-B2	07/10/89	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	ND
SF-B6	07/10/89	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	ND
SF-C5	07/10/89	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	ND
SF-D4	07/10/89	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	ND
SF-E3	07/10/89	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	ND
SF-F2	07/10/89	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	ND
SF-F6	07/10/89	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	ND
SF-A4	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-B2	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-B6	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-C3	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-C5	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-D1	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-D4	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-D7	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-E3	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-E5	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-F-2	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-F6	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-G4	03/01/90	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	ND
SF-B2	06/29/92	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-B6	06/29/92	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-C5	06/29/92	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-D1	06/29/92	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-D4	06/29/92	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-E3	06/29/92	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-F2	06/29/92	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-F6	06/29/92	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND

Note: The symbol "< " denotes a non-detect at the numerical level listed.

Table C-7 (cont'd), ODMD Site F Sediment Samples, 1989-1992 High Polynuclear Aromatic Hydrocarbon (PAH) (ppb). (For sample location map see Figure C-4, Page C-12).

Station	Date	Benzo(a)-anthracene	Benzo(b,k)-floranthenes	Benzo-perylene	Benzo(a)-pyrene	Chrysene	Dibenzo(a,h)-anthracene	Indeno-pyrene	Fluor-anthene	Pyrene	Total High PAHs
SF-B2	07/10/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	<30.0	
SF-B6	07/10/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	<30.0	ND
SF-C5	07/10/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	<30.0	ND
SF-D4	07/10/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	<30.0	ND
SF-E3	07/10/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	<30.0	ND
SF-F2	07/10/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	<30.0	ND
SF-F6	07/10/89	<30.0	<50.0	<130.0	<60.0	<30.0	<130.0	<130.0	<30.0	<30.0	ND
SF-A4	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-B2	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-B6	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-C3	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-C5	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-D1	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-D4	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-D7	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-E3	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-E5	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-F-2	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-F6	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-G4	03/01/90	<50.0	<150.0	<200.0	<150.0	<50.0	<200.0	<200.0	<150.0	<50.0	ND
SF-B2	06/29/92	<20.0	<40.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-B6	06/29/92	<20.0	<40.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-C5	06/29/92	<20.0	<40.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-D1	06/29/92	<20.0	<40.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-D4	06/29/92	<20.0	<40.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-E3	06/29/92	<20.0	<40.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND
SF-F2	06/29/92	<20.0	<40.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	**20.0**	**20.0**
SF-F6	06/29/92	<20.0	<40.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	ND

Note: The symbol "< " denotes a non-detect at the numerical level listed.

Table C-8, Mouth of the Columbia River (Offshore) Surface Sediment, 1992 Physical Analysis and TOC. (For sample location map see Figure C-5, Page C-14).

Site	Date	Median (mm)	Sand (%)	Vfsand (%)	Fines (%)	Volsol (%)	TOC %
MCR-BC-01	23-Jul-92	0.092	99.6	75.6	5.5	0.9	0.01
MCR-BC-02	23-Jul-92	0.1	99.8	64.3	4.6	0.5	0.01
MCR-BC-03	23-Jul-92	0.11	99.6	58.2	3.3	0.5	0.01
MCR-BC-04	23-Jul-92	0.12	99.5	54.3	1.6	0.9	0.02
MCR-BC-05	23-Jul-92	0.099	99.3	66.4	9.1	0.9	0.01
MCR-BC-06	23-Jul-92	0.098	99.9	72.1	11.8	0.9	0.01
MCR-BC-07	23-Jul-92	0.1	99.5	62.9	4.2	0.8	0.01
MCR-BC-08	23-Jul-92	0.13	98.8	49.7	2.5	0.7	0.01
MCR-BC-09	23-Jul-92	0.094	99.1	74.4	1.7	1.0	0.06
MCR-BC-10	23-Jul-92	0.098	98.9	69.0	3.6	1.1	0.02
MCR-BC-11	23-Jul-92	0.073	98.8	95.2	36.8	2.8	0.01
MCR-BC-12	23-Jul-92	0.086	99.9	82.5	20.7	0.8	0.01
MCR-BC-13	23-Jul-92	0.09	99.4	77.0	8.8	1.0	0.01
MCR-BC-14	23-Jul-92	0.12	98.9	55.5	5.5	0.5	0.01
MCR-BC-15	23-Jul-92	0.13	98.4	49.9	1.8	0.7	0.01
MCR-BC-16	23-Jul-92	0.081	99.9	91.0	23.2	1.0	0.06
MCR-BC-17	23-Jul-92	0.12	97.8	52.6	0.4	0.7	0.07
MCR-BC-18	23-Jul-92	0.13	98.5	48.6	26.3	6.6	0.02
MCR-BC-19	23-Jul-92	0.086	97.6	69.1	54.4	3.7	0.03
MCR-BC-20	23-Jul-92	0.08	99.7	89.8	28.6	1.4	0.01
MCR-BC-21	23-Jul-92	0.087	99.8	87.5	20.9	1.3	0.01
MCR-BC-22	23-Jul-92	0.15	96.6	31.3	0.4	0.6	0.07
MCR-BC-23	23-Jul-92	0.17	91.5	16.6	0.3	4.3	0.03
MCR-BC-24	23-Jul-92	0.12	97.7	51.3	43.7	4.2	0.01
MCR-BC-25	23-Jul-92	0.082	99.8	95.1	22.1	1.5	0.01
MCR-BC-26	23-Jul-92	0.1	96.7	67.1	2.6	0.8	0.05
MCR-BC-27	23-Jul-92	0.16	95.2	23.2	0.5	0.7	0
MCR-BC-28	23-Jul-92	0.15	98.7	32.7	24.1	1.8	0.14
MCR-BC-29	23-Jul-92	0.09	97.4	80.6	25.6	2.1	0.15
MCR-BC-30	23-Jul-92	0.068	91.1	82.3	52.9	3.8	0.04
MCR-BC-31	23-Jul-92	0.064	99.1	98.7	54.4	3.7	0.02
MCR-BC-32	23-Jul-92	0.12	91.9	55.3	11.1	1.0	0.04
MCR-BC-33	23-Jul-92	0.15	94.4	34.0	3.4	0.8	0.07
MCR-BC-34	23-Jul-92	0.11	97.6	61.6	20.9	2.1	0.1
MCR-BC-35	23-Jul-92	0.15	97.7	33.5	21.1	2.1	0.01
MCR-BC-36	23-Jul-92	0.12	97.6	53.5	37.2	2.7	0
MCR-BC-37	23-Jul-92	0.18	83.7	9.9	1.2	0.8	0.01
MCR-BC-38	23-Jul-92	0.21	64.1	7.4	1.2	0.6	0.04
MCR-BC-39	23-Jul-92	0.21	65.0	16.5	4.5	0.6	0.07
MCR-BC-39A	23-Jul-92	0.083	91.1	65.2	40.4	2.4	0.06
MCR-BC-40	23-Jul-92	0.15	98.7	30.1	20.9	2.2	0.01
MCR-BC-41	23-Jul-92	0.16	98.8	24.6	12.8	1.5	0
MCR-BC-42	23-Jul-92	0.17	86.9	18.0	0.5	0.5	0.03
MCR-BC-43	23-Jul-92	0.18	72.2	23.7	0.4	0.6	0.02
MCR-BC-44	23-Jul-92	0.13	98.6	44.5	10.7	1.3	0.01
MCR-BC-45	23-Jul-92	0.16	98.7	24.3	0.5	0.7	0.01
MCR-BC-46	23-Jul-92	0.13	98.2	43.5	0.4	0.6	0.03
MCR-BC-47	23-Jul-92	0.12	96.0	52.2	0.5	0.3	0.01
MCR-BC-48	23-Jul-92	0.14	99.3	36.0	0.8	3.0	0.01
MCR-BC-49	23-Jul-92	0.12	99.8	53.7	7.4	1.5	0.01
MCR-BC-50	23-Jul-92	0.13	98.4	49.7	0.4	0.6	
MCR-BC-51	23-Jul-92	0.12	98.6	54.5	0.3	0.7	

Table C-9 (Cont'd), Mouth of the Columbia River (Offshore) Surface Sediment, 1992 Metals Analysis (ppm). (For sample location map see Figure C-5, Page C-14).

Site	Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
MCR-BC-01	23-Jul-92	5	0.03	24	6.6	4.9	<0.012	13	48
MCR-BC-02	23-Jul-92	3.7	0.02	28	5.9	4.3	<0.01	13	51
MCR-BC-03	23-Jul-92	3.9	0.02	20	5.3	3.5	<0.012	10	41
MCR-BC-04	23-Jul-92	4.1	0.02	14	3.9	3.7	<0.013	7.6	35
MCR-BC-05	23-Jul-92	4	0.02	25	6.2	5	<0.012	12	46
MCR-BC-06	23-Jul-92	2.6	0.03	27	6.3	4.8	<0.014	13	49
MCR-BC-07	23-Jul-92	3.7	0.02	29	6.2	4.4	<0.013	13	53
MCR-BC-10	23-Jul-92	3.9	0.02	16	5.7	3.6	0.018	8.2	42
MCR-BC-11	23-Jul-92	8.5	0.12	30	12	6.7	0.029	15	66
MCR-BC-12	23-Jul-92	3.7	0.02	24	6.4	5.7	0.02	13	53
MCR-BC-13	23-Jul-92	3	0.03	20	7.3	2.5	<0.011	11	48
MCR-BC-14	23-Jul-92	2.3	0.01	20	5.3	2.8	0.011	12	48
MCR-BC-15	23-Jul-92	2.6	0.03	31	5.6	<2	0.017	14	59
MCR-BC-16	23-Jul-92	1.8	0.04	26	8.4	<2	0.019	13	55
MCR-BC-17	23-Jul-92	2.6	0.05	25	4.8	2.2	<0.014	12	50
MCR-BC-18	23-Jul-92	7.8	0.15	29	7.7	3.9	0.017	14	59
MCR-BC-19	23-Jul-92	6.8	0.19	32	13	7.3	<0.012	15	72
MCR-BC-20	23-Jul-92	3.4	0.08	22	7.9	4.2	0.019	11	56
MCR-BC-21	23-Jul-92	2.4	0.08	0	8.2	2.7	0.028	11	53
MCR-BC-22	23-Jul-92	1.5	0.01	22	4.8	<2	0.024	12	45
MCR-BC-23	23-Jul-92	2.2	0.01	20	3.1	<2	<0.014	9.5	44
MCR-BC-24	23-Jul-92	4.2	0.08	30	9.8	5.8	0.019	14	60
MCR-BC-25	23-Jul-92	4.4	0.1	26	8.7	3.3	0.022	13	58
MCR-BC-26	23-Jul-92	1.4	0.02	34	6.6	<2	0.014	16	67
MCR-BC-27	23-Jul-92	1.4	0.01	31	6.4	<2	<0.01	15	60
MCR-BC-28	23-Jul-92	8.3	0.17	29	6.7	5.2	<0.014	14	54
MCR-BC-29	23-Jul-92	0.78	0.12	31	8.4	5.4	<0.014	15	60
MCR-BC-30	23-Jul-92	7.3	0.19	30	21	7.6	<0.019	16	86
MCR-BC-31	23-Jul-92	6.4	0.45	26	20	7.1	0.03	14	84
MCR-BC-32	23-Jul-92	2.4	0.05	30	8.4	2.5	<0.015	14	61
MCR-BC-33	23-Jul-92	2.7	0.05	21	6.9	2.1	<0.014	13	51
MCR-BC-34	23-Jul-92	6.6	0.1	28	5.8	3.7	<0.01	13	49
MCR-BC-35	23-Jul-92	5.3	0.06	31	9.9	5.2	<0.016	14	60
MCR-BC-36	23-Jul-92	5.4	0.12	29	14	5.6	0.021	15	70
MCR-BC-37	23-Jul-92	1.9	0.02	12	4.1	2.2	0.013	8.2	33
MCR-BC-38	23-Jul-92	1.9	0.02	13	3.5	<2	<0.013	9.1	35
MCR-BC-39	23-Jul-92	2.3	0.03	21	4	3.6	<0.012	12	47
MCR-BC-39A	23-Jul-92	2.7	0.07	21	12	4.3	<0.014	14	66
MCR-BC-40	23-Jul-92	3.7	0.06	29	8.9	4.5	0.02	14	58
MCR-BC-41	23-Jul-92	2.1	0.04	30	5.1	4	0.015	13	54
MCR-BC-42	23-Jul-92	1.2	0.01	35	4.4	<2	0.011	15	62
MCR-BC-43	23-Jul-92	1.4	0.01	18	2.5	<2	<0.011	11	38
MCR-BC-44	23-Jul-92	2.2	0.02	32	2.9	4	<0.013	15	47
MCR-BC-45	23-Jul-92	2.3	0.02	32	2.8	<2	<0.013	14	45
MCR-BC-46	23-Jul-92	1.1	0.01	84	5.7	<20	<0.009	18	120
MCR-BC-47	23-Jul-92	1.2	-0.01	95	18	<19	0.012	32	160
MCR-BC-48	23-Jul-92	3.9	0.02	42	2.7	4	<0.013	20	45
MCR-BC-49	23-Jul-92	1.6	0.01	48	1.6	2.1	<0.013	13	45
MCR-BC-50	23-Jul-92	0.69	0.02	73	9.5	<20	<0.01	<10	100
MCR-BC-51	23-Jul-92	4.7	-0.01	30	2.4	2.2	<0.013	16	40

Note: The symbol "< " denotes non-detect at the numerical level inticated.

Table C-9 (cont'd), Mouth of the Columbia River (Offshore) Surface Sediment, 1992 Pesticide/ PCB (ppb). (For sample location map see Figure C-5, Page C-14).

Site	Date	Aldrin	Chlordane	Dieldrin	DDD	DDE	DDT	Heptachlor	Lindane	PCB
MCR-BC-01	23-Jul-92	<0.6	<0.6	<0.8	<1	<0.8	<2	<0.6	<0.6	<10
MCR-BC-02	23-Jul-92	<0.54	<0.54	<0.72	<0.9	<0.72	<1.8	<0.54	<0.54	<9
MCR-BC-03	23-Jul-92	<0.55	<0.55	<0.73	<0.92	<0.73	<1.8	<0.55	<0.55	<9
MCR-BC-04	23-Jul-92	<0.6	<0.6	<0.8	<0.99	<0.8	**3.4**	<0.6	<0.6	<10
MCR-BC-05	23-Jul-92	<0.58	<0.58	<0.77	<0.96	<0.77	<1.9	<0.58	<0.58	<10
MCR-BC-07	23-Jul-92	<0.59	<0.59	<0.78	<0.98	<0.78	<2	<0.59	<0.59	<10
MCR-BC-10	23-Jul-92	<0.62	<0.62	**3.1**	<1	<0.83	<2.1	<0.62	**0.86**	<10
MCR-BC-11	23-Jul-92	<0.68	<0.68	**6.5**	<1.1	**1.2**	<2.3	<0.68	**1.9**	<11
MCR-BC-12	23-Jul-92	<0.62	<0.62	**3.6**	<1	<0.83	<2.1	<0.62	**1.5**	<10
MCR-BC-13	23-Jul-92	<0.63	<0.63	<0.84	<1	<0.84	<2.1	<0.63	**1**	<10
MCR-BC-14	23-Jul-92	<6.2	<6.2	**4.7**	<1	<0.82	<2	<6.2	**1.6**	<10
MCR-BC-15	23-Jul-92	<0.61	<0.61	**5**	<1	<0.81	<2	<0.61	**1.3**	<10
MCR-BC-16	23-Jul-92	<0.63	<0.63	<0.84	<1	<0.84	<2.1	<0.63	**0.78**	<10
MCR-BC-17	23-Jul-92	<0.6	<0.6	**2.7**	<1	<0.8	<3.7	<0.6	**1.2**	<10
MCR-BC-18	23-Jul-92	<0.6	<0.6	**4.3**	<1	<0.81	**3**	<0.6	**1.3**	<1
MCR-BC-19	23-Jul-92	<0.63	<0.63	**4.5**	**1.2**	**2.8**	<2.1	<0.63	**1.2**	<11
MCR-BC-20	23-Jul-92	<0.63	<0.63	**4.1**	<1	<0.84	<2.1	<0.63	**2**	<10
MCR-BC-21	23-Jul-92	<0.62	<0.62	**1**	<1	<0.83	<2.1	<0.62	<0.62	<10
MCR-BC-22	23-Jul-92	<0.58	<0.58	<0.77	<0.96	<0.77	<1.9	<0.58	<0.58	<10
MCR-BC-23	23-Jul-92	<0.58	<0.58	<0.78	<0.97	<0.78	<1.9	<0.58	**0.79**	<10
MCR-BC-24	23-Jul-92	<0.63	<0.63	<0.83	<1	<0.83	<2.1	<0.63	<0.63	<10
MCR-BC-25	23-Jul-92	<0.62	<0.62	**1.2**	<1	<0.83	<2.1	<0.62	<0.62	<10
MCR-BC-26	23-Jul-92	<0.54	<0.54	<0.73	<0.91	<0.73	<1.8	<0.54	**0.71**	<9
MCR-BC-27	23-Jul-92	<0.53	<0.53	<0.71	<0.88	<0.71	<1.8	<0.53	**1.4**	<9
MCR-BC-28	23-Jul-92	<0.61	<0.61	<0.82	<1	<0.82	**2.8**	<0.61	**3.4**	<10
MCR-BC-29	23-Jul-92	<0.6	<0.6	**3.7**	<1	**0.8**	<2	<0.6	**0.95**	<10
MCR-BC-30	23-Jul-92	<0.9	<0.9	**2.2**	<1.5	<1.2	<3	<0.9	<0.9	<15
MCR-BC-31	23-Jul-92	<0.87	<0.87	<1.2	<1.4	**1.2**	<2.9	<0.87	<0.87	<14
MCR-BC-32	23-Jul-92	<0.62	<0.62	<0.83	<1	<0.83	**2.1**	<0.62	<0.62	<10
MCR-BC-33	23-Jul-92	<0.61	<0.61	<0.81	<1	<0.81	<2	<0.61	<0.61	<10
MCR-BC-34	23-Jul-92	<0.58	<0.58	**2**	<0.96	<0.77	<1.9	<0.58	**1.3**	<10
MCR-BC-35	23-Jul-92	<0.68	<0.68	<0.91	<1.1	<0.91	<2.3	<0.68	<0.68	<11
MCR-BC-36	23-Jul-92	<0.68	<0.68	<0.9	<1.1	<0.9	<2.3	<0.68	<0.68	<11
MCR-BC-37	23-Jul-92	<0.56	<0.56	<0.75	<0.56	<0.75	<1.9	<0.56	<0.56	<9
MCR-BC-38	23-Jul-92	<0.54	<0.54	<0.72	<0.91	<0.72	<1.8	<0.54	<0.54	<9
MCR-BC-39	23-Jul-92	<0.54	<0.54	<0.73	<0.91	<0.73	<1.8	<0.54	<0.54	<9
MCR-BC-39A	23-Jul-92	<0.62	<0.62	<0.83	<1	<0.83	<2.1	<0.62	<0.62	<10
MCR-BC-40	23-Jul-92	<0.6	<0.6	<0.81	<1	<0.81	<2	<0.6	<0.6	<10
MCR-BC-41	23-Jul-92	<0.57	<0.57	<0.76	<0.94	<0.76	<1.9	<0.57	<0.57	<9
MCR-BC-42	23-Jul-92	<0.53	<0.53	<0.71	<0.89	<0.71	<1.8	<0.53	**0.96**	<9
MCR-BC-43	23-Jul-92	<0.53	<0.53	<0.71	<0.88	<0.71	<1.8	<0.53	**0.65**	<9
MCR-BC-44	23-Jul-92	<0.6	<0.6	<0.8	<1	<0.8	<2	<0.6	**0.64**	<10
MCR-BC-45	23-Jul-92	<0.58	<0.58	<0.78	<0.97	<0.78	<1.9	<0.58	**1.4**	<10
MCR-BC-46	23-Jul-92	<0.53	<0.53	<0.7	<0.88	<0.7	<1.8	<0.53	**0.89**	<9
MCR-BC-47	23-Jul-92	<0.51	<0.51	<0.69	<0.86	<0.68	<1.7	<0.51	**0.8**	<9
MCR-BC-48	23-Jul-92	**0.77**	<0.61	<0.81	<1	<0.81	<2	<0.61	**1.4**	<10
MCR-BC-49	23-Jul-92	<0.54	<0.54	<0.72	<0.9	<0.72	<1.8	<0.54	**1.4**	<9
MCR-BC-50	23-Jul-92	<0.58	<0.58	<0.77	<0.97	<0.77	<1.9	<0.58	<0.58	<10
MCR-BC-51	23-Jul-92	<0.53	<0.53	<0.7	<0.88	<0.7	<1.8	<0.53	**1.3**	<9
MCR-BC0-6	23-Jul-92	<0.59	<0.59	<0.78	<0.98	<0.78	<2	<0.59	<0.59	<10

Note: The symbol "< " denotes a non-detect at the numerical level indicated.

Table C-9 (Cont'd), MCR (Offshore) Surface Sediment, 1992 Low Polynuclear Aromatic Hydrocarbons (PAHs) (ppb) (For sample location map see Figure C-5, Page C-14).

Site	Date	Acenaphthene	Anthracene	Fluorene	Napthalene	Phenanthrene	Total Low PAHs
MCR-BC-01	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-02	23-Jul-92	<18	<18	<18	<18	<18	0
MCR-BC-03	23-Jul-92	<18	<18	<18	<18	<18	0
MCR-BC-04	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-05	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-06	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-07	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-10	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-11	23-Jul-92	<22	<22	<22	<22	<22	0
MCR-BC-12	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-13	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-14	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-15	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-16	23-Jul-92	<21	<21	<21	<21	<21	0
MCR-BC-17	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-18	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-19	23-Jul-92	<21	<21	<21	<21	**21**	**21**
MCR-BC-20	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-21	23-Jul-92	<21	<21	<21	<21	<21	0
MCR-BC-22	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-23	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-24	23-Jul-92	<21	<21	<21	<21	<21	0
MCR-BC-25	23-Jul-92	<21	<21	<21	<21	<21	0
MCR-BC-26	23-Jul-92	<18	<18	<18	<18	<18	0
MCR-BC-27	23-Jul-92	<17	<17	<17	<17	<17	0
MCR-BC-28	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-29	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-30	23-Jul-92	<30	<30	<30	<30	<30	0
MCR-BC-31	23-Jul-92	<28	<28	<28	<28	<28	0
MCR-BC-32	23-Jul-92	<21	<21	<21	<21	<21	0
MCR-BC-33	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-34	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-35	23-Jul-92	<22	<22	<22	<22	<22	0
MCR-BC-36	23-Jul-92	<22	<22	<22	<22	<22	0
MCR-BC-37	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-38	23-Jul-92	<18	<18	<18	<18	<18	0
MCR-BC-39	23-Jul-92	<18	<18	<18	<18	<18	0
MCR-BC-39A	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-40	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-41	23-Jul-92	<18	<18	<18	<18	<18	0
MCR-BC-42	23-Jul-92	-17	<17	<17	<17	<17	0
MCR-BC-43	23-Jul-92	-17	<17	<17	<17	<17	0
MCR-BC-44	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-45	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-46	23-Jul-92	<17	<17	<17	<17	<17	0
MCR-BC-47	23-Jul-92	<17	<17	<17	<17	<17	0
MCR-BC-48	23-Jul-92	<20	<20	<20	<20	<20	0
MCR-BC-49	23-Jul-92	<18	<18	<18	<18	<18	0
MCR-BC-50	23-Jul-92	<19	<19	<19	<19	<19	0
MCR-BC-51	23-Jul-92	<17	<17	<17	<17	<17	0

Note: The symbol "< " denotes a non-detect at the numerical level indicated.

Table C-9 (cont'd), MCR (Offshore) Surface Sediment, 1992 High Polynuclear Aromatic Hydrocarbons (PAHs) (ppb). (For sample location map see Figure C-5, Page C-14).

Site	Benzo(a)anthracene	Benzofluroanthene	Benzoperylene	Benzopyrene	Chrysene	Dibenzanthracene	Fluoranthene	Idenopyrene	Pyrene	Tot H PAHs
MCR-BC-01	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-02	<18	<18	<18	<18	<18	<18	<18	<18	<18	0
MCR-BC-03	<18	<18	<18	<18	<18	<18	<18	<18	<18	0
MCR-BC-04	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-05	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-06	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-07	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-10	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-11	<22	<22	**22**	**24**	<22	<22	**29**	<22	**37**	**112**
MCR-BC-12	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-13	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-14	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-15	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-16	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-17	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-18	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-19	**24**	**26**	**24**	**32**	**26**	<21	**47**	**23**	**44**	**246**
MCR-BC-20	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-21	<21	<21	<21	<21	<21	<21	<21	<21	<21	0
MCR-BC-22	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-23	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-24	<21	<21	<21	<21	<21	<21	<21	<21	<21	0
MCR-BC-25	<21	<21	<21	<21	<21	<21	<21	<21	<21	0
MCR-BC-26	<18	<18	<18	<18	<18	<18	<18	<18	<18	0
MCR-BC-27	<17	<17	<17	<17	<17	<17	<17	<17	<17	0
MCR-BC-28	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-29	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-30	<30	<30	<30	<30	<30	<30	**33**	<30	**35**	**68**
MCR-BC-31	<28	<28	<28	**31**	**29**	<28	**38**	<28	**36**	**134**
MCR-BC-32	<21	<21	<21	<21	<21	<21	<21	<21	<21	0
MCR-BC-33	<20	<20	<20	<20	<20	<20	**28**	<20	**25**	**53**
MCR-BC-34	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-35	<22	<22	<22	<22	<22	<22	<22	<22	<22	0
MCR-BC-36	<22	<22	<22	<22	<22	<22	<22	<22	**23**	**23**
MCR-BC-37	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-38	<18	<18	<18	<18	<18	<18	<18	<18	<18	0
MCR-BC-39	<18	<18	<18	<18	<18	<18	<18	<18	<18	0
MCR-BC-39	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-40	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-41	<18	<18	<18	<18	<18	<18	<18	<18	<18	0
MCR-BC-42	<17	<17	<17	<17	<17	<17	<17	<17	<17	0
MCR-BC-43	<17	<17	<17	<17	<17	<17	<17	<17	<17	0
MCR-BC-44	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-45	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-46	<17	<17	<17	<17	<17	<17	<17	<17	<17	0
MCR-BC-47	<17	<17	<17	<17	<17	<17	<17	<17	<17	0
MCR-BC-48	<20	<20	<20	<20	<20	<20	<20	<20	<20	0
MCR-BC-49	<18	<18	<18	<18	<18	<18	<18	<18	<18	0
MCR-BC-50	<19	<19	<19	<19	<19	<19	<19	<19	<19	0
MCR-BC-51	<17	<17	<17	<17	<17	<17	<17	<17	<17	0

Note: The symbol "<" denotes a non-detect at the numerical level listed.

Table C-10, Mouth of the Columbia River (Offshore) Surface Sediment, 1993 Physical Analysis. (For sample location map see Figure C-7, Page C-17).

Location	Site	Date	(mm) Median	(Sand	% Vfsand	Fines	) Volsol
Mouth of the Columbia River	MCR-B-12	28-Jul-93	0.1	99.5	64.6	11.7	0.8
Mouth of the Columbia River	MCR-B-15	28-Jul-93	0.13	99.1	48.2	3.4	0.7
Mouth of the Columbia River	MCR-B-30	28-Jul-93	0.094	94.4	64.6	27.3	3.1
Mouth of the Columbia River	MCR-B-31	28-Jul-93	0.096	96.5	63.9	26.7	2.7
Mouth of the Columbia River	MCR-B-32	28-Jul-93	0.08	92.9	71.3	36.3	3.3
Mouth of the Columbia River	MCR-B-33	28-Jul-93	0.14	96.0	38.6	7.3	1.0
Mouth of the Columbia River	MCR-B-36	28-Jul-93	0.14	95.1	36.6	11.7	1.5
Mouth of the Columbia River	MCR-B-37	28-Jul-93	0.19	80.9	10.9	2.7	1.2
Mouth of the Columbia River	MCR-B-39	28-Jul-93	0.13	79.6	49.7	36.4	3.4
Mouth of the Columbia River	MCR-B-42	28-Jul-93	0.17	87.5	15.6	1.7	0.6
Mouth of the Columbia River	MCR-B-45	28-Jul-93	0.16	98.9	24.0	2.4	1.2
Mouth of the Columbia River	MCR-B-52	28-Jul-93	0.16	90.4	25.1	13.8	3.4
Mouth of the Columbia River	MCR-B-53	28-Jul-93	0.15	92.0	32.4	18.9	3.1
Mouth of the Columbia River	MCR-B-54	28-Jul-93	0	88.1	81.0	77.2	9.0
Mouth of the Columbia River	MCR-B-55	28-Jul-93	0.17	97.6	16.2	4.8	1.2
Mouth of the Columbia River	MCR-B-56	28-Jul-93	0.16	98.1	17.1	2.3	1.1
Mouth of the Columbia River	MCR-B-57	28-Jul-93	0.15	98.4	30.2	1.5	0.7
Mouth of the Columbia River	MCR-B-58	28-Jul-93	0.17	96.9	15.5	4.1	1.5
Mouth of the Columbia River	MCR-B-59	28-Jul-93	0.16	98.9	21.3	2.5	1.0
Mouth of the Columbia River	MCR-B-60	28-Jul-93	0.15	98.9	30.9	1.5	0.7
Mouth of the Columbia River	MCR-B-A4	28-Jul-93	0.19	81.0	10.7	1.5	1.1
Mouth of the Columbia River	MCR-B-A7	28-Jul-93	0.17	97.4	16.1	2.2	1.1
Mouth of the Columbia River	MCR-B-B2	28-Jul-93	0.17	94.8	17.8	3.2	1.1
Mouth of the Columbia River	MCR-B-B6	28-Jul-93	0.18	81.0	11.1	2.1	0.8
Mouth of the Columbia River	MCR-B-C5	28-Jul-93	0.21	65.3	3.4	2.3	0.9
Mouth of the Columbia River	MCR-B-D1	28-Jul-93	0.17	85.5	17.4	4.6	0.9
Mouth of the Columbia River	MCR-B-D7	28-Jul-93	0.15	96.9	29.5	2.0	0.0
Mouth of the Columbia River	MCR-B-E3	28-Jul-93	0.19	80.4	6.7	1.7	0.9
Mouth of the Columbia River	MCR-B-F2	28-Jul-93	0.22	62.7	5.6	1.8	0.8
Mouth of the Columbia River	MCR-B-G1	28-Jul-93	0.19	76.5	7.7	1.1	0.6

Note: Site lacations with alapha/numeric designation are sample locations studied under the Tongue Point Monitoring Program.

Table C-11, Mouth of the Columbia River (Offshore) Surface Sediment, 1994 Physical Analysis. (For sample location map see Figure C-7, Page C-17).

Location	Site	Date	(mm) Median	(Sand	% Vfsand	Fines	) Volsol
Mouth of the Columbia River	MCR-B-12	15-Sep-94	0.1	99.9	68.6	12.0	0.6
Mouth of the Columbia River	MCR-B-15	15-Sep-94	0.11	99.4	58.7	8.0	0.7
Mouth of the Columbia River	MCR-B-30	15-Sep-94	0.038	98.5	87.6	73.6	5.2
Mouth of the Columbia River	MCR-B-31	15-Sep-94	0.073	99.4	78.2	46.7	2.7
Mouth of the Columbia River	MCR-B-33	15-Sep-94	0.15	95.7	34.3	8.7	0.9
Mouth of the Columbia River	MCR-B-36	15-Sep-94	0.13	97.5	49.4	26.9	1.8
Mouth of the Columbia River	MCR-B-37	15-Sep-94	0.17	90.1	17.0	2.2	0.8
Mouth of the Columbia River	MCR-B-39	15-Sep-94	0.062	90.1	67.0	58.9	1.6
Mouth of the Columbia River	MCR-B-42	15-Sep-94	0.21	67.7	6.5	1.6	0.7
Mouth of the Columbia River	MCR-B-45	15-Sep-94	0.16	99.1	25.6	2.0	0.7
Mouth of the Columbia River	MCR-B-52	15-Sep-94	0.15	98.0	30.3	17.7	0.4
Mouth of the Columbia River	MCR-B-53	15-Sep-94	0.14	96.2	40.3	29.4	2.2
Mouth of the Columbia River	MCR-B-54	15-Sep-94	0.05	93.8	68.5	63.0	3.1
Mouth of the Columbia River	MCR-B-55	15-Sep-94	0.16	98.3	25.1	11.3	1.2
Mouth of the Columbia River	MCR-B-56	15-Sep-94	0.16	98.5	25.7	9.7	0.1
Mouth of the Columbia River	MCR-B-57	15-Sep-94	0.14	98.8	35.1	6.9	0.3
Mouth of the Columbia River	MCR-B-58	15-Sep-94	0.16	98.6	22.4	10.4	1.3
Mouth of the Columbia River	MCR-B-59	15-Sep-94	0.16	99.9	24.9	5.6	0.6
Mouth of the Columbia River	MCR-B-60	15-Sep-94	0.15	98.6	31.4	1.6	0.6
Mouth of the Columbia River	MCR-B-A4	15-Sep-94	0.21	65.2	4.8	2.4	0.8
Mouth of the Columbia River	MCR-B-A7	15-Sep-94	0.16	97.2	22.3	2.0	0.5
Mouth of the Columbia River	MCR-B-B2	15-Sep-94	0.16	95.6	22.9	7.2	1.0
Mouth of the Columbia River	MCR-B-B6	15-Sep-94	0.19	76.2	7.5	4.8	0.5
Mouth of the Columbia River	MCR-B-C5	15-Sep-94	0.19	79.0	10.3	2.0	0.6
Mouth of the Columbia River	MCR-B-D1	15-Sep-94	0.16	89.6	31.1	19.8	2.0
Mouth of the Columbia River	MCR-B-D7	15-Sep-94	0.21	69.8	4.1	0.8	0.5
Mouth of the Columbia River	MCR-B-E3	15-Sep-94	0.17	89.8	20.0	7.6	0.6
Mouth of the Columbia River	MCR-B-F2	15-Sep-94	0.36	18.1	0.9	0.5	0.3
Mouth of the Columbia River	MCR-B-G1	15-Sep-94	0.15	87.2	33.2	15.1	1.2

Note: Site locations with alapha/numeric designation are sample locations studied under the Tongue Point Monitoring Program

Table C-12, ODMDS Study 1995, Physical Analysis. (For location map see FigureC- 8, Page C-18).

Location	Site	Date	Median (mm)	Sand (%)	Fine <0.0625mm	Volsol (%)
ODMDS - MCR '95	Station 1	31-Oct-95	0.13	97.0	3.0	0.6
ODMDS - MCR '95	Station 2	31-Oct-95	0.12	93.7	6.3	0.7
ODMDS - MCR '95	Station 3	31-Oct-95	0.096	92.0	8.0	0.9
ODMDS - MCR '95	Station 4	31-Oct-95	0.13	95.4	4.6	0.7
ODMDS - MCR '95	Station 5	31-Oct-95	0.11	90.1	9.9	0.6
ODMDS - MCR '95	Station 6	31-Oct-95	0.096	87.8	12.2	0.9
ODMDS - MCR '95	Station 7	31-Oct-95	0.12	93.7	6.3	0.6
ODMDS - MCR '95	Station 8	31-Oct-95	0.11	93.1	6.9	0.7
ODMDS - MCR '95	Station 9	31-Oct-95	0.096	87.3	12.7	0.8
ODMDS - MCR '95	Station 10	31-Oct-95	0.091	86.1	13.9	1.6
ODMDS - MCR '95	Station 11	31-Oct-95	0.12	95.0	5.0	1.0
ODMDS - MCR '95	Station 12	31-Oct-95	0.096	89.8	10.2	0.9
ODMDS - MCR '95	Station 13	31-Oct-95	0.091	87.1	12.9	1.1
ODMDS - MCR '95	Station 14	31-Oct-95	0.092	84.3	15.7	1.4
ODMDS - MCR '95	Station 15	13-Oct-95	0.081	58.8	41.2	4.1
ODMDS - MCR '95	Station 16	13-Oct-95	0.054	48.2	51.8	4.6
ODMDS - MCR '95	Station 17	19-Oct-95	0.14	76.0	23.9	3.1
ODMDS - MCR '95	Station 18	5-Oct-95	0.090	81.3	18.7	1.6
ODMDS - MCR '95	Station 19	5-Oct-95	0.089	83.0	17.0	1.8
ODMDS - MCR '95	Station 20	5-Oct-95	0.15	80.5	19.5	2.2
ODMDS - MCR '95	Station 21	5-Oct-95	0.081	69.0	31.0	2.4
ODMDS - MCR '95	Station 22	5-Oct-95	0.087	71.8	28.2	2.8
ODMDS - MCR '95	Station 23	5-Oct-95	0.084	60.1	39.9	3.9
ODMDS - MCR '95	Station 24	5-Oct-95	0.16	86.6	13.4	2.1
ODMDS - MCR '95	Station 25	5-Oct-95	0.13	69.2	30.8	3.3
ODMDS - MCR '95	Station 26	5-Oct-95	0.099	77.7	22.3	1.7
ODMDS - MCR '95	Station 27	5-Oct-95	0.15	78.5	21.5	2.2
ODMDS - MCR '95	Station 28	1-Nov-95	0.15	69.9	30.1	1.8
ODMDS - MCR '95	Station 29	1-Nov-95	0.16	85.0	15.0	1.9
ODMDS - MCR '95	Station 30	1-Nov-95	0.16	88.7	11.3	1.5
ODMDS - MCR '95	Station 31	1-Nov-95	0.14	78.0	22.0	2.3
ODMDS - MCR '95	Station 32	1-Nov-95	0.16	90.5	9.5	1.3
ODMDS - MCR '95	Station 33	1-Nov-95	0.16	90.1	8.9	1.5
ODMDS - MCR '95	Station 34	1-Nov-95	0.16	90.6	9.4	1.7
ODMDS - MCR '95	Station 35	1-Nov-95	0.15	84.3	15.7	1.6
ODMDS - MCR '95	Station 36	1-Nov-95	0.093	66.3	33.7	3.7
		Average	**0.117**	**82.1**	**17.8**	**1.8**

Table C-13, ODMDS Study 1996, Physical Analysis. (For location map see FigureC- 8, Page C-18).

Location	Site	Date	Median (mm)	Sand (%)	Fine <0.0625mm	Volsol (%)
ODMDS - MCR '96	MCR-96-01	3-Jun-96	0.12	94.8	5.2	0.6
ODMDS - MCR '96	MCR-96-02	3-Jun-96	0.11	93.1	6.9	0.7
ODMDS - MCR '96	MCR-96-03	3-Jun-96	0.097	90.8	9.2	0.8
ODMDS - MCR '96	MCR-96-04	3-Jun-96	0.12	93.4	6.6	0.9
ODMDS - MCR '96	MCR-96-05	3-Jun-96	0.11	87.3	12.7	0.7
ODMDS - MCR '96	MCR-96-06	3-Jun-96	0.099	89.1	10.9	0.7
ODMDS - MCR '96	MCR-96-07	3-Jun-96	0.11	91.4	8.6	0.7
ODMDS - MCR '96	MCR-96-08	3-Jun-96	0.11	89.3	10.7	0.6
ODMDS - MCR '96	MCR-96-09	3-Jun-96	0.098	86.4	13.6	1.1
ODMDS - MCR '96	MCR-96-10	3-Jun-96	0.081	73.0	27.0	2.6
ODMDS - MCR '96	MCR-96-11	5-Jun-96	0.1	90.5	9.5	1.0
ODMDS - MCR '96	MCR-96-12	5-Jun-96	0.092	83.0	17.0	1.2
ODMDS - MCR '96	MCR-96-13	5-Jun-96	0.082	72.4	27.6	1.3
ODMDS - MCR '96	MCR-96-14	5-Jun-96	0.085	77.1	22.9	2.1
ODMDS - MCR '96	MCR-96-15	5-Jun-96	0.08	59.2	40.8	3.3
ODMDS - MCR '96	MCR-96-16	5-Jun-96	0.13	65.1	34.9	3.7
ODMDS - MCR '96	MCR-96-17	5-Jun-96	0.13	52.7	47.3	4.2
ODMDS - MCR '96	MCR-96-18	6-Jun-96	0.089	81.7	18.3	1.3
ODMDS - MCR '96	MCR-96-19	6-Jun-96	0.081	69.7	30.3	2.3
ODMDS - MCR '96	MCR-96-20	6-Jun-96	0.14	55.1	44.9	3.5
ODMDS - MCR '96	MCR-96-21	6-Jun-96	0.083	72.9	27.1	1.8
ODMDS - MCR '96	MCR-96-22	6-Jun-96	0.046	45.5	54.5	3.4
ODMDS - MCR '96	MCR-96-23	6-Jun-96	0.043	49.1	50.9	3.9
ODMDS - MCR '96	MCR-96-24	6-Jun-96	0.14	75.3	24.7	2.7
ODMDS - MCR '96	MCR-96-25	6-Jun-96	0.13	70.7	29.3	2.8
ODMDS - MCR '96	MCR-96-26	6-Jun-96	0.12	86.5	13.5	1.9
ODMDS - MCR '96	MCR-96-27	6-Jun-96	0.14	76.5	23.5	2.7
ODMDS - MCR '96	MCR-96-28	10-Jun-96	0.16	83.1	16.9	1.8
ODMDS - MCR '96	MCR-96-29	10-Jun-96	0.14	68.7	31.3	2.5
ODMDS - MCR '96	MCR-96-30	10-Jun-96	0.15	82.9	17.1	2.1
ODMDS - MCR '96	MCR-96-31	10-Jun-96	0.13	67.9	32.1	3.1
ODMDS - MCR '96	MCR-96-32	10-Jun-96	0.16	89.8	10.2	1.0
ODMDS - MCR '96	MCR-96-33	10-Jun-96	0.15	78.3	21.7	1.0
ODMDS - MCR '96	MCR-96-34	10-Jun-96	0.16	88.8	11.2	1.0
ODMDS - MCR '96	MCR-96-35	10-Jun-96	0.15	82.1	17.9	1.9
ODMDS - MCR '96	MCR-96-36	10-Jun-96	0.12	69.1	30.9	2.6
ODMDS - MCR '96	MCR-96-37	5-Jun-96	0.14	95.7	4.3	0.4
ODMDS - MCR '96	MCR-96-37B	6-Jun-96	0.12	95.2	4.8	0.8
ODMDS - MCR '96	MCR-96-37C	6-Jun-96	0.16	93.5	6.5	0.7
		Average	**0.116**	**78.6**	**21.4**	**1.8**